

Vol. VIII

NOVEMBER, 1924

# AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY

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PUBLISHED BY C. V. MOSBY COMPANY, 508 NORTH GRAND BLVD., ST. LOUIS, U. S. A.

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# The American Journal of Obstetrics and Gynecology

VOL. VIII

ST. LOUIS, NOVEMBER, 1924

No. 5

## Original Communications

### MILK INJECTIONS IN GYNECOLOGY AND OBSTETRICS\*

BY GEORGE GELLHORN, M.D., F.A.C.S., ST. LOUIS, MO.

(From the Department of Gynecology and Obstetrics, St. Louis University School of Medicine)

ALL activities of the normal cell are produced by stimuli. The same is true if the cell is in an abnormal state. "Disease," says Ver-worn,<sup>1</sup> "is simply response to stimulation. Disease is life under altered vital conditions, and altered vital conditions are stimuli."

Generally speaking, stimuli are either excitants or depressants. Harmful, i. e., disease producing stimuli, whether of bacterial origin or toxic, traumatic, thermic, chemical or photic in nature, usually depress cell function at once; less often does the stage of depression follow one of excitation.<sup>2</sup> In either event the cell reacts with various defensive measures and exhibits, as Petersen<sup>4</sup> puts it, a consistent effort to dilute the noxious agent, to remove it by intracellular or extracellular digestion, to neutralize it; these failing, then to wall it off, to put it outside of the current of normal tissue activity.

This process characterizes the "acute" stage of any disease. In the subacute stage, the outcome still hangs in the balance, and restitution will depend on the ability of the cell to throw off its enemy. The transition into the chronic stage means that the cell is about to lose this chance.

*Such a fatigued cell, however, may yet recover its normal function if it receives a quickening ("exciting") stimulus before it is completely exhausted.* Dolley<sup>3</sup> has actually demonstrated the various morphologic changes through which a pathologically altered cell passes

\*Read at the Forty-ninth Annual meeting of the American Gynecological Society, Hot Springs, Va., May 15-17, 1924.

NOTE: The Editor accepts no responsibility for the views and statements of authors as published in their "Original Communications."

in its recovery until it again attains its original form and with it its original function.

It is this possibility of recharging the cell with energy which is the basis of the protein therapy. For it has been found,—empirically at first, but later amply confirmed by laboratory investigation,—that protein substances if introduced “parenterally,” that is, by subcutaneous, intravenous or intramuscular injection, have the faculty of stimulating the cells of the body to greater activity—of “activating the protoplasm.”

We know many beneficial cell stimuli—fresh air, for example, sunlight, water in various forms of application, heat in moderate degrees and other means of producing hyperemia, etc.—but none of them is probably as powerful as the parenteral administration of proteins which exerts its influence upon *all* cells of the body. In addition to this “omnicellular” effect, there is an even more marked impress made upon those cells which have been weakened or paralyzed by disease. This is, after all, not very surprising since we have learned from physiologic researches that any cell previously involved, let us say, in an inflammatory process, responds to stimuli of all kinds more readily than a normal cell.<sup>4</sup>

Whatever the explanation of this interesting phenomenon, it will suffice for our present purposes to appreciate the fact that by the reviving stimulus of the protein injections, the affected cells are rescued from bondage, as it were; some of their normal vigor returns, and their natural means of defense become reassembled. They are now in a position to renew the struggle against the invading microbes which represent the vast majority of causes of disease. The protoplasm again develops phagocytic properties, the toxins are neutralized by a fresh production of antibodies and ferments, the local metabolism is intensified, and the pus is absorbed. Under favorable circumstances, the infected organ or tissue may thus rid itself of its enemy, and more or less normal conditions may be reestablished.

The fascinating story of how this knowledge has been acquired in the last eight or nine years, is very interestingly told in Petersen's admirable book. Only this much must be said here that the protein therapy grew out of the immunizing and curative treatment with sera and vaccines which has prevailed in medical science for the last thirty years. But whereas the basic principle had heretofore been that the organism in its resistance to disease and defense against bacterial invasion must be supported by essentially *specific* means, the protein therapy rests upon a *nonspecific* basis. In other words, it is now a definitely established fact that many infectious diseases can be cured by the introduction into the body of nonspecific substances which in themselves, have no relation whatever to the infection under treatment.

If we apply this conception of the action of protein therapy to our special field, we may, as a familiar example, picture to ourselves an inflamed and swollen, and even an occluded and distended tube taking up an invisible warfare against the gonococci and their products. If the affected cells had become sufficiently stimulated and strengthened and if at the same time the original virulence of the infecting microbes had somewhat abated, the tube may emerge victorious from the struggle, with the gonococci destroyed, the pus absorbed, and the tissues of the tube normal or fairly normal in size and softness.

Puerperal sepsis may serve as a second example. Here where the entire body is being inundated from the original site of the infection, the defensive powers of the organism mobilized by the protein injection, may succeed in eliminating the disease altogether or, at least, in localizing it at its primary focus where it would be accessible to surgical treatment.

It stands to reason that only those cells can take up the fight for existence with any prospect of success that have not been hopelessly and permanently damaged, and as a matter of fact, practical experience has shown that protein therapy gives a greater promise of cure the earlier in the course of the disease the treatment is instituted.

There are involved in this process intricate and complicated biologic and morphologic problems, some of which are as yet imperfectly understood, while others are sufficiently classified. I refer to Weichardt, Von den Velden, Döllken, Jobling and Petersen, Luithlen, Starkenstein and numerous others<sup>5</sup> who have accurately studied the increased vasomotor and glandular activity, the variations in the nitrogen metabolism and the permeability of the blood vessels, the increase in the amount of blood sugar, fibrinogen and thrombokinase, and many other phenomena which follow the injection of proteins.

Aside from these changes within the organism there are certain well-defined outward manifestations which are observed by the clinician. These appear in the form of the so-called general reaction consisting in most cases of chills and more or less high fever, in others merely in a very slight rise of temperature accompanied by nausea, headache, perspiration or a vague malaise; complete absence of this general response is rather rare. The rate of pulse and respiration is but little affected, but there is always a transitory hyperleucocytosis. After intramuscular injection the general reaction is, as a rule, much less stormy than after intravenous administration and shows, moreover, a tendency to grow progressively less after succeeding injections. In addition to these constitutional manifestations there is also a "focal" reaction in the affected part which while probably present in all cases, evidences itself only now and then by increased pain and swelling of the inflammatory tumor, both of which, however, are of very short duration.



Both Petersen<sup>4</sup> and Lindig<sup>6</sup> present extensive lists of protein substances which have been used for therapeutic or experimental purposes. Among these may be mentioned: normal blood (human, horse, sheep, beef, goat, chicken, etc.) and immune sera (antistreptococcus, antimeningococcus, human convalescent, etc.); antitoxins (diphtheria, tetanus); cerebrospinal and pleural fluid; egg albumin and seralbumin; milk; casein; nucleoprotein; peptone; leukocytic extract; extracts of tissues (cartilage, etc.) and of endocrine glands; vaccines of all kinds; tuberculin; Coley's fluid, colloidal metals (col-largol). There are also several nonprotein substances, such as turpentine, which have been injected for the same purpose of plasma activation; these produce local destruction of tissue within the reach of the injected agent; the cell detritus is reabsorbed into the organism and now acts as a foreign protein.

For practical purposes only a few of these numerous agents need be considered. Of these, milk is probably the most extensively used at present. Robert Schmidt, of Prague, who introduced it in 1916, selected it because it was always available, even in the remotest village, and because its source, the organism of the cow, seemed to him as reliable as any chemical laboratory.<sup>7</sup>

Milk is sterilized by pasteurization, in the autoclave, or by boiling in a water-bath for ten minutes. The last-named method is the simplest in general practice, unless one prefers the sterile pharmaceutical milk preparations which are marketed in ampoules under various trade names (aolan, albusol, etc.). The results are more or less the same whatever form of milk one uses, and this holds also true of the casein, of which Lindig<sup>8</sup> who inaugurated the casein therapy, claims that it represents the potent factor in the milk. Casein is likewise supplied in sterile ampoules (casein, caseosan) and is administered intravenously in very small doses.

With the exception of a few aolan injections, my personal experiences were obtained altogether with whole milk. In the beginning I used only certified milk but later injected ordinary hospital milk with equally good results. Indeed, Barkan and Nelson<sup>10</sup> believe that milk with a high bacterial count is more efficacious because of its contents of bacterial proteins.

The site of injection is, preferably, the gluteal musculature, and if the needle is thin and sharp and the injection is made slowly, the procedure is not painful though the bulk of the fluid injected may cause a momentary discomfort. Sensitive infiltrations need not be anticipated as after mercury injections, nor have I ever observed an abscess formation.

The initial dose is 5 c.c., occasionally even less if the patient is very weak or the fever very high, also whenever any of the special conditions to be mentioned later among the contraindications, de-

mand caution. The standard dose is 10 c.c. which, depending on individual circumstances, is reached with the second or third injection and then maintained through the course of treatment. The interval between injections is, as a rule, from three to five days according to the intensity of the reaction; in indolent patients it may occasionally be reduced to two days.

In mild cases, one or two injections will often suffice; in others, more are required. The average number in my cases was about six. In puerperal infections, von Jaschke advises to continue the treatment until the fever has definitely disappeared. Kleeblatt<sup>9</sup> attempts to determine the question of dosage and interval by repeated blood studies, but in general practice the intensity of reaction and clinical judgment of the patient's resistance will be sufficient guides. There must be a certain limit to the number of protein injections lest they produce "protein cachexia," because excessive or protracted stimulation in itself must eventually lead to fatigue and exhaustion of the cells. Fortunately, this condition has thus far been observed only in animal experimentation.

The general reaction occurred in my cases, as a rule, from six to eight hours after the treatment. The fever following the chill was, in the majority of instances, of moderate degree though occasionally it rose to 103° and 104° and once even reached 105°. However, as pointed out in previous publications,<sup>12</sup> the reaction assumed much milder forms in almost half of the cases. The intensity of the initial reaction which, in my experience, decreases after succeeding injections, is rather generally considered a favorable prognostic sign unless it be excessive, but I have had several most satisfactory results where there was hardly any general reaction.

In any event, the general condition is affected but a very short time, twenty-four hours at most, after which the euphoria, which is mentioned by all writers, is quite marked. The patients look and feel decidedly better and their appetite is improved. Systematic white blood counts revealed a hyperleucocytosis on an average of 20,000 to 25,000 on the day following the injection, which receded to more normal figures within the next two days. I have not observed excessive degrees of 40,000 such as Petersen mentions. The behavior of the leucocytes depends, of course, on the original leucocytosis and the general state of the patient.

The focal reaction in my cases was, on the whole, insignificant. In a few of the gonorrheal patients I have observed an increase of pain and adnexal swelling which gave way to subjective and objective improvement after from two to four injections.

An anaphylactic shock has never occurred in my cases nor need it be anticipated. While this alarming complication has repeatedly been observed after intravenous injections of casein, only three such

cases have been reported among the many thousands of intramuscular injections of milk.<sup>11</sup> It may be that in these cases part of the injection had accidentally reached a vein, and I make it a point to test, before each injection, whether the needle has punctured a vessel.

The principal field for protein therapy in gynecology is in the treatment of pelvic infections, particularly those of gonorrheal origin. Usually, a marked subjective improvement follows promptly after one or two injections and is but rarely delayed until after the third or fourth treatment. It is this very relief from pain which makes it so difficult to keep our clinical patients who are wage earners and anxious to return to work, in the hospital long enough to obtain the corresponding objective results. When the patient remains under sufficient treatment, the steady diminution and eventual disappearance of the adnexal tumors may well be observed in favorable cases. Other things being equal, such a gratifying outcome is more often accomplished in private patients. A case in point is the following:

CASE 1. Mrs. F., twenty-eight years old, patient of Dr. C. E. Burford. Gonorrheal infection three weeks ago (gonococci in cervical smear). Ascending gonorrhea followed menstruation a week ago. Local peritonitis and large bilateral pyosalpinx, practically unaffected by the usual conservative measures. Transfer to hospital. Seven milk injections, combined after some time with protracted hot douches and dry heat, brought about a *complete* cure, both objective and subjective, in five weeks, which has now continued for two and a half years.

This case, which represents the subacute type of infection, offers two very interesting points. To begin with, there was at no time a general reaction other than drowsiness, and no focal reaction whatever. Secondly, in this case the cervical gonorrhea healed without any local treatment. Smears from urethra and cervix made at intervals for four months, were free from bacteria and pus cells. I have had but one other case of this sort. In all the rest, the injections did not affect the gonorrheal foci in cervix and urethra, and this seems to have been the experience of other writers on the subject.

The effect of milk injections in chronic recurrent adnexal infection is illustrated by the following case:

CASE 2. Mrs. R., aged thirty-seven, patient of Dr. B. F. Striegel. Recurrent attacks of abdominal pain. Present attack has lasted for almost six weeks and is growing worse (pyrexia, meteorism, menorrhagia, etc.). Very large bilateral pyosalpinx and diffuse edema of pelvic cellular tissue. Nine milk injections, the second injection followed by marked focal reaction, were given within twenty days and combined with protracted hot douches. Subjective well being ensued promptly. Both adnexa became normal. A flat, hard exudate on anterior surface of sacrum remained.

Six months later recurrence of old symptoms, this time with formation of a large exudate which fills entire pelvis and extends upward to within two fingers' width of umbilicus. Again sent to hospital and treated with milk injections, hot douches, and dry heat. The fever disappeared after the third injection, the exudate



after the ninth. Both tubes are now found thickened but painless, and the subjective well-being has, at present writing, persisted for four months.

The chronicity of the infection in this case was a rather severe test for protein therapy; yet, the milk injections yielded a very satisfactory result though they could not forestall a recurrence. The condition was clearly unsuited for operation during both attacks, but I feel that now the best course to pursue would be a panhysterectomy to which, however, the patient raises objections.

With our floating clinical material it is difficult to obtain statistical data. Among my first ten patients with frank gonorrhea, there were six cures, two improvements, and two failures.<sup>12</sup> If I had been able to keep track of a larger number of patients, the percentage of cure would probably have decreased. Even then, the fact that a considerable number of these patients can be cured without a mutilating operation, stamps the protein therapy as one of the most important advances of modern medicine. Trossarello's<sup>13</sup> results in 20 cases of gonorrheal adnexitis surpassed those obtained with specific vaccines or anti-serums. Stegemann<sup>14</sup> saw in 30 cases treated with milk 20 per cent cure, 50 per cent improvement, and 30 per cent failure. He contrasts these results with those obtained from the usual conservative methods, namely, rest in bed, hot fomentations or dry heat, whereby he observed in 70 cases cure in 18.6 per cent, improvement in 51.4 per cent and failure in 30 per cent. The logical conclusion is to combine the milk injections with other tried forms of treatment.

Of other venereal affections which are favorably influenced by protein therapy, the successes of Gärtner<sup>15</sup> in the treatment of chronic inflammations of Bartholin's glands may be mentioned. Numerous reports testify also to the effect of milk injections in buboes; in most of the cases the injections practically aborted the lesions.<sup>16</sup>

I have observed an equally rapid result, from one injection, in three instances of nonspecific boils about the genitals; in one case, a second abscess appeared two or three weeks later and required one more injection.

Von Jaschke<sup>17</sup> praises the success of protein injections in genital and peritoneal tuberculosis. "Hyperpyretic and extremely sick patients became afebrile, sometimes after only three injections, and felt so much improved that they could barely be kept in bed."

A mixed infection was probably the etiology in the following two cases.

CASE 3. Mrs. M., thirty-one years old, has introduced into her own uterus a slippery elm tent in the mistaken idea that she was pregnant. Admitted to hospital on Oct. 27, 1921, with chills, fever of 104°, pulse 120, leucocytes 23,800. Mass size of man's fist in right pelvic half, rapidly growing larger, bulging into culdesac, fluctuating. Seven milk injections sufficed, without any other treatment, to bring about a complete absorption of the acute exudate. Two months later she was back at work and has remained well ever since.

CASE 4. Mrs. B., aged twenty-one years, patient of Dr. F. C. Bram, had a curettage, five weeks after delivery, for retained placental tissue. Perforation of uterus, recognized immediately and treated with suitable conservative means. Fever commenced three days later, and within a week a fluctuating tumor developed behind the uterus which extended upward almost to the umbilicus and bulged deeply into the culdesac. After five milk injections every trace of this mass had disappeared in eighteen days, and the patient has remained perfectly well for more than two years.

In yet another patient, the pelvic tumor was of an entirely obscure origin. She had a severe cystitis, and with each micturition large quantities of air escaped from the bladder. The cause of this phenomenon could not be ascertained. Her very poor general condition permitted of no exploratory operation, and she was given milk injections to build up her general resistance. The result was very satisfactory; the cystitis improved markedly, and the escape of air ceased; in fact, the patient felt so completely restored after about three weeks that she refused operation.

I have repeatedly injected milk in weakened patients, particularly those with uterine cancer, to prepare them better for the strain of an operation. In postoperative complications such as disturbances of wound healing I have used the milk treatment a few times but the results were not conclusive; in one case of postoperative pneumonia, on the other hand, two milk injections cleared up the condition very promptly.

There was, finally, a case with a very unusual indication where milk injections yielded a wholly unexpected result.

CASE 5.—This patient had received radium treatment for an inoperable cancer of the cervix. The subsequent shrinkage of the tumor masses and the formation of cicatricial tissue obliterated the cervical canal and there ensued a pyometra which within a few weeks extended as high as the umbilicus. I tried to open up and drain the uterine cavity but the dense mass of scar tissue defied my attempts. I then put the patient on the milk treatment merely in the hope of ameliorating her desolate general condition. Much to my surprise, the uterus grew steadily smaller and after twelve injections was practically of normal size. Simultaneously the appearance of the patient and her subjective condition were those of a healthy person, and this improvement continued to within a short time of her death, two months later.

In closing the chapter on protein therapy in gynecology, it may be well to state that not all parts of the genital tract respond equally well to milk injections. The tubes, the uterus, and probably the bladder, are favorably influenced while the ovaries seem to remain refractory. Exudates are brought to absorption, or else a circumscribed suppuration is hastened so that they can be attacked surgically. Adhesions are not affected. Gonorrheal infection of the cervix, as a rule, remains likewise untouched by the treatment, and so are gonorrheal foci in the urethra and rectum. These, therefore, must be treated separately to prevent reinfection.

In obstetrics, protein therapy has yielded to the majority of the writers most satisfactory results in various forms of puerperal infection. Even those who, like Doederlein,<sup>18</sup> are still somewhat skeptical, would consider it a mistake to omit this means of treatment. Of course, it is a difficult matter to gauge correctly the connection between cause and effect, because there is no way of telling whether the patient in a given case might not have recovered without protein injections. Yet, it is the alpha and the omega of medical wisdom that the outcome in puerperal sepsis depends altogether on the power of resistance of the organism; and there is no doubt in anybody's mind, despite all the gaps in our knowledge, that protein injections immensely enhance this power of resistance. An attempt to tabulate the effect of this therapy was made by Simon<sup>19</sup> who injected milk in thirty cases of febrile abortion and found that the average duration of the fever was from one to two days shorter than in the cases not treated in this manner. This author also records 24 cures in 26 cases of outspoken puerperal sepsis and recommends a combination of ergot and milk: the contractions produced by the former in the flabby, infected uterine musculature close open vessels and prevent, mechanically, the entrance of bacteria and toxins, while the foreign protein stimulates the cells to do away with the microbes.

The considerable number of cases reported from several of the leading clinics on the Continent proves convincingly that the favorable alteration of puerperal infections by protein injection is not merely a matter of coincidence. To be sure, there are a good many failures in this class of cases. This is to be expected if the treatment was not begun early enough. After the entire organism has been inundated with the infectious agents and the cells of the body have been completely exhausted, no amount of stimulation can avail. It is, therefore, essential, as von Jaschke<sup>20</sup> and Lindig<sup>6</sup> point out, to commence the treatment as early as possible and to subject any and every puerpera to protein injection as soon as fever occurs.

My own experiences coincide closely with those recorded in literature. In mild infections, a single injection would sometimes turn the tide and be followed by an afebrile puerperium. That, further, even a severe and generalized sepsis can be cured by protein therapy may be shown by the following case.

CASE 6.—Primipara of thirty-two years, patient of Dr. Damron. Premature rupture of membranes. After thirty hours of labor delivery by midforceps in a farmhouse; second degree tear. There followed two weeks of chills, one to three daily, and fever which on one occasion rose to 108°! On transfer to the city, insignificant findings on examination; slight tenderness of right parametrium. Lochia normal. Urine negative. Leucocytosis of 12,400 with 80 per cent polymorphonuclears. Diagnosis: Pyemia arising from septic thrombosis of pelvic veins.

Plan of treatment: fresh air; forced feeding; milk injections.

Patient received five injections in first nine days. Lytic decrease of fever, and



complete disappearance of chills. Leucocytic reaction varied between 16,200 and 20,500. Very marked subjective improvement. After two weeks, a large abscess developed in culdesac which was incised and drained. Six days later a second abscess in the right labium majus and beneath the mons veneris required incision; from the immense abscess cavity a sequester of the symphysis was removed. After another two weeks, copious expectoration of sputum containing streptococci, staphylococci and pneumococci, disclosed the breaking through of a pulmonary abscess. Finally, an abscess occurred in the right thigh which, on incision, was found to have laid the sartorius muscle bare. During the protracted course of the illness patient received seven additional milk injections. Ultimate outcome: complete recovery.\*

It seems to me that the gratifying result obtained in this case brings out the two essential points in protein therapy. The cell stimulation produced by the milk injections before complete exhaustion had set in, checked the progress of an infection of which we know from an unfortunately extensive experience that it almost always leads to death, and it also localized the various embolic metastases and favored the speedy formation of circumscribed abscesses thereby preventing them from becoming secondary foci of a generalized sepsis.

Of other febrile complications in the puerperium I wish to mention two cases of puerperal pyelitis which were cured after two and three injections, respectively.

The curative effect of plasma activation has induced a number of writers to inject proteins prophylactically in all cases where a febrile puerperium might be expected from the nature of the confinement.

Protein injections, finally, have been suggested as a galactagogue. The opinions regarding this particular indication are still divided; my own experience limited thus far to one case, was inconclusive.

I have already pointed out that the milk injections should occasionally be combined with other methods. Indeed, there is no reason whatever to discard tried and valuable modes of treatment.

It has become obvious that milk injections—or, generally speaking, protein therapy—have a very extensive applicability in gynecology and obstetrics. A moment's reflection will make the widespread usefulness of this novel agent appear less surprising. We call the new method a therapy, and yet, strictly speaking, it is not a mode of treatment in itself. It is merely a means to set in motion reactions with which we have long been familiar, the same reactions in fact which the organism uses to defend itself against disease.

In spite of its ample scope, however, its limitations must not be overlooked. There are several absolute contraindications, such as cardiac decompensation, diabetes, and alcoholism. Whether pregnancy belongs to this group is still an open question. Petersen enjoins great caution where there is a history of hypersensitiveness on the part of the patient (serum sickness, asthma, urticaria, angioneurotic edema)

\*The case will later be published in detail.

or of epilepsy or other grave nervous instability. Above all, the state of the disease and the condition of the patient must be considered. Only if the cells are not hopelessly damaged or if the patient has not reached the state of complete fatigue, may milk injections be tried lest they superimpose an extra demand to which the exhausted organism must succumb.

But even where protein therapy is clearly indicated, success is not achieved in all cases. Disappointing though this is, a certain percentage of failures must be expected. *Protein therapy is as little a cure-all as any other mode of treatment.* To employ it injudiciously and by rule of thumb in one and every case threatens to bring a valuable method into discredit. Moreover, we are but at the threshold of this new field and its vast outlook. The skeptic may conceivably refuse to enter because there is still too much in a state of flux, too much that has not yet been definitely proved. But those who have passed through the gate and have been rewarded with unexpected success, are not likely to become discouraged by occasional failures but will continue to explore the new territory. A number of important problems are yet to be worked out by the clinician. The determination of the dosage, for instance, is still entirely empirical. It may be that the object of cell stimulation in the various ailments will be better accomplished by one or the other protein substance,\* or that changes from one to another substance will be found desirable in different stages of the same disease. Finally, the combination of specific with nonspecific therapy may offer possible advantages in certain forms of disease.

Whatever its present shortcomings, let us bear in mind that nonspecific therapy is, probably, the most rational of all forms of medical therapeutics in that it exerts its influence directly upon the very basis of disease, namely, the affected cell. "Needless to say," to quote Petersen, "nonspecific therapy does require judgment, careful attention and bedside study on the part of the physician, perhaps in greater measure than any other therapeutic procedure. It should never be a routine; to be useful it must be an individualized therapy, with dosage and preparation and time of application varied according to the disease, its intensity, its duration, and the resistance of the patient. So used, nonspecific therapy should prove to be one of our most useful measures both in acute infectious diseases and chronic inflammations."

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\*This refers, for instance, to the interesting observations of A. Mayer concerning the effect of serum of normal gravaide upon toxic dermatoses in pregnancy.

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METROPOLITAN BUILDING.

(For discussion see page 649.)

## RECENT OBSERVATIONS OF CERTAIN PATHOLOGICAL CONDITIONS OF THE AMNION\*

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IN the routine examination and study of the placenta, one observes from time to time, certain small areas on the surface of the amnion, which appear in the gross as changes in the membrane. From the literature on the placenta it is seen that lesions have been noted in one form or another by some of the older writers on obstetrics and pathology, as well as by some of the more recent observers.

J. Y. Simpson, in his classic monograph on "*Pathological Observations on Diseases of the Placenta*," mentioned certain lesions of the amnion as "floculi of coagulable lymph," and associated them with inflammation. He also notes that these spots are seen in cases of "dropsy of the amnion." Rokitsanski in his "*Manual of Pathological Anatomy*," recognizes the presence of these lesions. To quote:—"The dirty white and ash-colored spots occurring in various sizes upon the amnion and accompanied by thickening of the membranes, and the opacity sometimes affecting the greater part of the amnion, evidence previous inflammation." Again he notes—"Occasionally the membranes, in consequence of a cretification of the deposit, are encrusted or contain chalky grit."

The observations of the occurrences of these lesions by these older writers are of value only as case examples, for at the time, no accurate histologic studies were made, owing to the current limitations of microscopy and microscopical technic. After the establishment of more careful methods, by which the microscopical structure of the tissues could be studied, more investigators took up the study of the amnion. In the search for the origin of the amniotic fluid, various workers found considerable variation in the structure of the amniotic

\*Read at a meeting of the St. Louis Gynecological Society, May 9, 1924.



epithelium. It has been demonstrated by von Franque, Polano, Bondi, Mandl, Forssell, and others, that the amnion shows differences in structure over various areas in the same cases. Although this fact has been well established for many years, the various textbooks for medical students do not mention it. This is also true of the reference books gone over in the preparation of this paper.

Von Franque, in 1897, described certain warty and nodular elevations occurring on the surface of the amnion. These areas showed proliferative changes in the epithelium, with stratification and cornification, as well as an overgrowth of connective tissue through defects in the epithelial layer and extending over the surface of the amnion. In these cellular masses he found lanugo hairs, epithelium, and vernix caseosa. The description given does not correspond with the findings described in this paper.

Holzapfel, in 1904, described one type of lesion showing cornification of the amniotic epithelium with proliferation. However, the observation was originally made in a case of deformity of the fetus and the author suggests the possibility of these areas as being transplants of fetal ectoderm. There was no evidence of transplants in any of the cases noted in this paper.

Sitzenfrey, in 1911, in work on anomalies of the amnion, reported a few cases where lesions were seen on the amnion. The type of lesion itself was not accurately described. The lesions he had reference to seemed to be due to areas of proliferating amniotic epithelium, with surface changes and secondary changes in the subepithelial connective tissue. In these cases the lesions were studied for evidence of tuberculosis, but no characteristic pathology was made out. The evidence for tuberculous infection of the amniotic fluid was very meagre, even when animal inoculation was resorted to as a diagnostic measure. In cases reported by Sitzenfrey it was noted that there was a definite oligohydramnios. The lesion was then investigated with the possibility in mind, that the lack of amniotic fluid might be the etiologic factor. Sitzenfrey reported that the detritic layer, seen over the surface of the amniotic epithelium, contained lanugo hairs and that the greater part of the material was composed of vernix caseosa. He then explained the lesion on the following basis:—On account of the insufficiency of amniotic fluid, the fetus was brought into direct apposition with the amnion. Because of this apposition, the lanugo hairs of the fetus perforated the epithelium of the amnion and set up an inflammatory reaction in the tissues, resulting in proliferation, with the adherence of some vernix caseosa and enmeshed lanugo hairs.

The reasons ascribed for the appearance of these lesions at the placental area of the amnion are: This portion of the tissue is relatively fixed and does not allow the freedom of movement between the fetus and adjacent membrane. This explanation seems rather vague and it is difficult to conceive of such unusual lesions produced by this method, where contact is made between two tissues so normally in relation. Then too, other observers have noted similar lesions in hydramnios, which fact shows a marked diversity of the conditions in which they may occur.

Other authors—namely Thoms and Creadick—have demonstrated cellular change in the amniotic epithelium which is dependent upon the length of time before delivery that the membranes rupture. Creadick has demonstrated bacterial invasion of the amnion in cases where the membranes were ruptured a relatively long time before delivery. None of the changes described by the latter authors would account for the lesions in question.

Since the first of these lesions were seen in our routine placental study, a careful search was made for more of the lesions in the case of each placenta studied. After a few lesions were noted it was seen that the gross picture presented two types of lesions, which will

be referred to subsequently in this paper as Type "A" and Type "B". The differences between both types are perfectly clear in the gross, so that from the gross appearance of any of these lesions the microscopic appearance can be foretold.



Fig. 1.—Section through entire lesion showing epithelial proliferation, and the dense granular area in the connective tissue stroma. Ob. Lab. No. 3911.

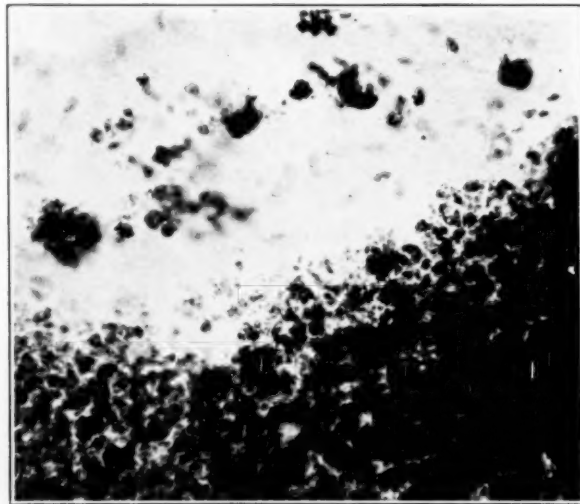


Fig. 2.—Higher power of left central portion of Fig. 1, the upper margin of the granular area. Above is the connective tissue in which a few pale nuclei are seen. Ob. Lab. No. 3911.

*Type "A"* consists of a well defined, round or ovoid area situated in the placental area of the amnion, or in the amnion near the placenta. In size the lesions thus far examined vary from 2 x 2 mm. to 5 x 7 mm. in diameter. The structure seems to be situated in the

amniotic membrane. In color it is a dirty white or cream color. The external surface is rather rugose. The surface is elevated slightly. The general appearance is that of a large bacterial or fungus colony growing on culture media. It is opaque, and when the amnion is

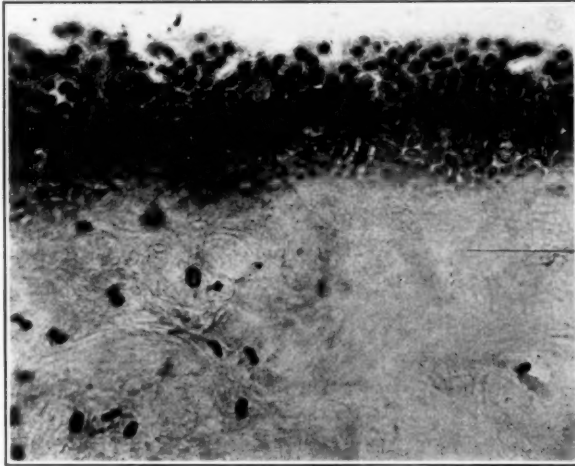


Fig. 3.—Higher power of upper portion of Fig. 1, showing proliferation of epithelium. Connective tissue on right shows fewer nuclei and a more homogenous appearance. Ob. Lab. No. 3911.

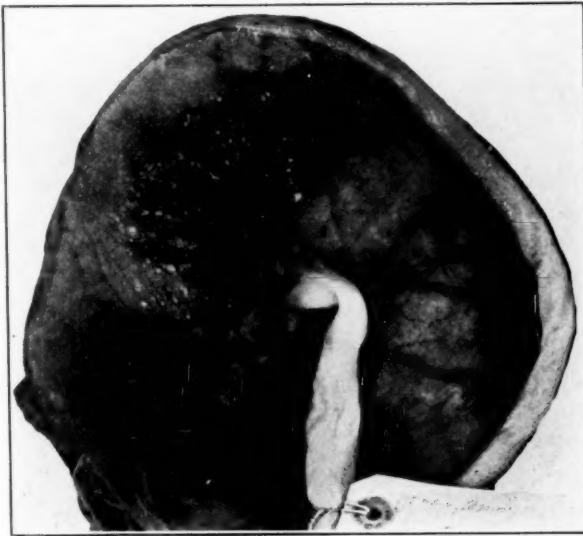


Fig. 4.—Photograph of placenta showing Type B lesions and distribution in amnion. Ob. Lab. No. 3938.

stripped off the chorion, it does not lose its identity as an amniotic growth. There has been only one of these growths seen in any single case.

On microscopic examination the principal change is seen within

the connective tissue (Fig. 1). Enclosed within the connective tissue is a diffuse, dense granular area which takes the hematoxylin stain deeply. On higher magnification it is seen to be made up of tiny granules and small fibrils (Fig. 2). This substance is the result of calcium deposit. In the preparation of these sections it was found necessary to decalcify the tissues before satisfactory sections could be obtained. Between the small granules the included substance takes a rather pink, homogenous stain. Nuclei of connective tissue cells in this area are very pale and appear degenerating. A few round cells are seen at the margins of the granular material. Around the calcified material the stroma has a more dense, hyaline appearance; fibrils are ill defined and nuclei are fewer. At either end of the region the normal stroma seems to separate and encapsulate the material. The epithelium over the area is not constant. There seems to be a tendency toward proliferation with squamous cell formation (Fig. 3). In one case the epithelium appeared normal, in another it was entirely degenerating; while in another the cells were all cylindrical with nuclei toward the free surface. In the cases where the epithelium appears most abnormal the connective tissue takes a more homogenous appearance, with fewer nuclei and a deeper pink stain. No bacteria could be found in any of the lesions.

*Type "B."* A flocculent, cretaceous area appearing on the placental area of the amnion, either singly or in numbers, usually in large numbers. These areas vary from the smallest macroscopic size to those with a diameter of eight millimeters. The outline is externally irregular and some of the plaques are confluent. They have the general appearance of having been sprayed on the amniotic surface as one would spray lime water from the end of a brush (Fig. 4)

These areas appear slightly elevated and some of the larger have an umbilicated appearance. The distribution of these lesions is quite irregular, some being scattered over a definite area of the placental surface while in other cases they have a linear arrangement, extending outward from the insertion of the cord. In the fresh and in the hardened specimens they do not rub off but maintain their positions even until the amnion is torn by rubbing. The opacity of these areas is very marked.

On microscopic study the primary changes are seen in the epithelium. At the margins of the areas in question the epithelium undergoes a rather sudden transition to the squamous type (Fig. 5). The cells of the base of these areas take a more intensive stain, with well-defined nuclei, usually toward the base of the cell. There is no basement membrane. Farther out in the layers the cells take a more squamous appearance and a lighter stain, with nuclear degeneration. At the outer surface where the cells are necrotic the epithelial surface is covered with deep pink-staining strands of degenerated cells and



detritis (Fig. 6). The general microscopic appearance is that of a hyperkeratosis. These degenerated outer layers show only very faint outlines of cell structure, with shadow-like areas at site of former nuclei. There is a very fine calcification in this cell debris, as evidenced by the bluish tinge seen under oil immersion lens. In no case could lanugo hairs be seen, or evidence of vernix caseosa be demon-

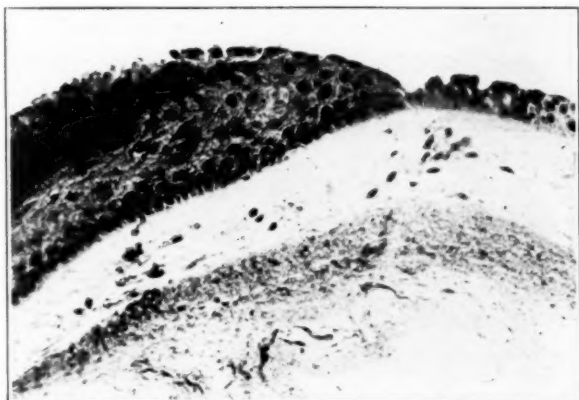


Fig. 5.—High power magnification at the margin of Type B lesion showing the sudden transition from the usual amniotic epithelium to the squamous type of epithelium with keratosis. Ob. Lab. No. 4103.

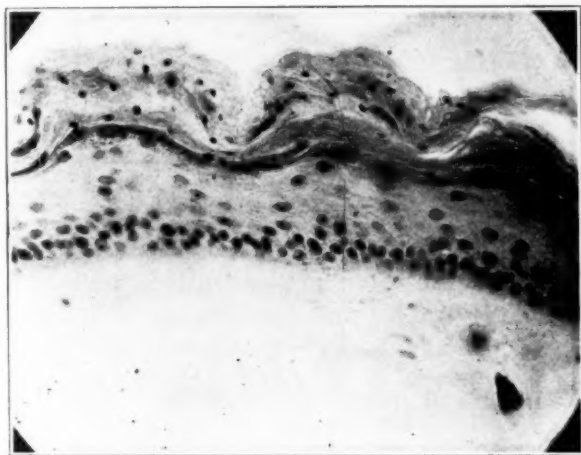


Fig. 6.—High power magnification of one of the lesions in Fig. 4, showing typical appearance of the lesions with squamous type of epithelium. Note nuclear degeneration in outlying layers. Only faint outlines of cells seen in outer layers. Stratification of cellular debris to the right. Subepithelial connective tissue is almost homogenous in this area. Nuclei are only faintly seen.

strated. In some of the outer cells were noted fine black granules, probably the same as noted by some of the other observers.

The subepithelial connective tissue also undergoes changes in the lesions. Just beneath the epithelium the connective tissue is more compact, takes a deeper pink stain and nuclei are fewer. The connec-

tive tissue as a whole is more fibrillar and throughout run longitudinal, wavy, fine calcium strands. This is not uniform in all cases but appears frequently. Where the connective change is most marked there are more round cells seen here and there. No bacteria could be found in any of these lesions. In the outer epithelial layers a few enmeshed red blood cells could be seen.

#### OCCURRENCE

In 248 placentae studied routinely the lesion "A", the first described, occurred eight times. The lesion "B", just described, occurred ten times. It is seen from the figures that these lesions are not rare. To give a brief clinical review of the cases in which these lesions occurred:

##### In cases of the first lesion, Type "A".

Seven mothers were multiparous.

Only one was luetic.

There were four with gestation of 40 weeks, one of 41 weeks, one of 39 weeks, and two of 36 weeks.

One had toxemia with albuminuria, hypertension and edema.

All of the children were living at birth with the exception of one stillbirth from the toxemic mother.

##### In the cases of the second lesion, Type "B".

Six of the mothers were multiparae and four were primiparae.

All children were born living.

Two mothers were being treated for lues; all others were nonluetie.

The periods of gestation were all forty weeks or more with the exception of one of 36½ weeks.

There were no cases of hydramnios, oligohydramnios, or twins in the series.

The placentae in these cases showed no striking lesions. There were the frequent small hematomata in some, others showed some red or white infarction. Several showed diffuse white mottling on maternal surface due to calcification.

#### SIGNIFICANCE AND CAUSES

Since in both types of these lesions the children showed no signs or symptoms of antenatal pathology referable to the lesion, it can be presumed that the lesion is of little apparent significance to the life of the child. The majority of the mothers were nonsyphilitic so that syphilis may be ruled out as a productive factor. The lesions were seen in primiparae as well as in multiparae. No bacteria or lanugo hairs were found. Since the fetal membranes are part of a caduceous organ in which senescent changes go on at the time of maturity, it seems that these lesions might be explained, at least in part, on that basis.

The first type of lesion, as has been shown, occurs within the sub-epithelial connective tissue at or near the placental site. Here the tissue is relatively fixed to the placental surface so that mobility in this area is limited. Any change in size or shape of the amniotic cavity would put a relative strain on the tissue at this area. Any defect in the tissue, as a result of interstitial tearing, would be compensated by an accumulation of serofibrinous exudate from the adjacent tissues; just as in the placenta itself near the time of maturity any injury is followed by the laying down of fibrin at the site. Subsequently calcification takes place in the serofibrinous deposit. There is moderate subsequent reaction in the adjacent connective tissue, with subsequent change in the epithelium overlying the area.

Type "B," the second type of lesion, probably represents another senile change in the tissue, involving primarily the epithelium. The amniotic epithelium, because of its structure and function, might be termed the endothelium of the amniotic cavity. Any injury or senile change in the character of the membrane would lead to a proliferation of cells, just as in the senile changes in the intima of the blood vessels, with proliferation and subsequent sclerosis, with degenerative and sclerotic changes in the underlying connective tissue. This particular type of epithelial change in the amnion is probably a characteristic metaplasia of this embryonic structure. In regard to this type of epithelial change in embryonic tissue, it may be mentioned in passing, that a similar change was noted in a case of dermoid cyst of the ovary. In a case recently studied by Dr. Otto Schwarz an epithelial change similar to the changes seen in the epithelium of the amnion was noted in a portion of the epithelium forming the cyst wall.

These explanations are hypothetical, but may very well be true on the basis of the senile nature of the amnion as the termination of gestation is approached.

#### CONCLUSIONS

1. Two types of lesions are relatively frequent in the amnion.
2. One consists primarily of calcium deposit in the subepithelial connective tissue, with subsequent changes in the epithelium.
3. The other is a primary change in the epithelium with subsequent changes in the connective tissue, accompanied by calcium deposit in the tissues affected.
4. These lesions are not dependent on conditions of hydramnios, oligohydramnios, disease of the fetus, or constitutional disease of the mother.
5. They are most probably brought about by senile changes primarily affecting the portion of tissue which shows primary changes.

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## CHORIOANGIOFIBROMA (CHORIOANGIOMA)

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(Continued from October issue.)

## ORIGIN

INASMUCH as neither the early forms nor the successive steps of the development of chorioangiofibromata have ever been incontestably identified, there exists much uncertainty in regard to both the time and place of origin. John Clarke, in 1798, said, "I am disposed, therefore, to consider this fleshy substance as a solitary instance of a formative property in the vessels of the placenta, etc.," and to this opinion very little has since been added. That the growth arises from the chorionic tissue of the placenta is evidenced by the histological structure. Danyau and Goodhart, though describing undoubted chorioangiofibromata, were apparently at a loss to explain their origin, speaking of them, with reservations, as organized blood clots. Certainly, with our later knowledge, the histological picture alone makes such an explanation untenable. Van der Feltz spoke of his well-defined chorioangiofibromata as "false knots" of the umbilical cord lying in the placental tissue, since he believed that he could distinguish a passage of cord tissue over into one of the tumors. However, the other had an investment of Langhans' cells and was connected to the cord by vessels only. Furthermore, he said, "Dieser Tumor bestand also offenbar aus angiomatös verändertem Chorionbindegewebe,—." Albert advanced the idea, in keeping with his time, that the vessels are derived from the allantois, and Dienst agreed to the same origin for the vessels and said that the tumor stroma came from the chorion. However, Schickele, in 1905, emphasized the fact that the villus vessels develop *in situ*, and that in man the allantois is rudimentary, the connection between the placenta and embryo being



by the umbilical vessels of the abdominal pedicle or "Bauchstiel"; which opinion is undoubtedly borne out by the facts. The question as to origin of these tumors from a single villus or from an adherent cluster of villi will be considered under the discussion of etiology. However, it may be stated here that the preponderance of evidence is in favor of development from a single villus.

The time of origin of these tumors is even less settled than is the place of their beginning. Upon purely theoretical grounds, Pitha, Albert, Beneke, Dienst and others have assigned the beginning development to the early weeks of pregnancy at the time when active vascularization and formation of the placenta is taking place, as at that period anomalies would naturally be most frequent and have the greatest effect upon later growth. Perhaps the findings of Storch might be considered in support of this idea of an early beginning, for he pointed out the not infrequent occurrence of hypertrophy of the villi in the placentas of early abortions, and considered this condition to be an early stage of chorioangiofibroma.

On the other hand, Kraus and Schickele believed that these tumors may begin at any time during pregnancy, usually after the villi are formed. Any opinion as to their origins can be only conjecture unless intermediate stages should be found to show the growth of these altered villi into the fully developed tumors, which with the single exception of the very doubtful case of Cammandeur-Lacassagne, have been described as occurring during the latter half of pregnancy. The epithelial covering offers no clue as to the period of onset, since in different tumors the syncytial cells and the Langhans layer have been present alone or in association with each other.

#### ETIOLOGY

When the uncertainty with regard to origin is borne in mind, it is not surprising that even more question exists concerning the predisposing factors and the etiology of these tumors. In fact, consideration and conjecture upon the basis of the available facts, although leading to the formation of various hypotheses, have failed to develop any which are entirely compatible with both recognized scientific principles and with the circumstances present in more than a small portion of the cases. In a preceding paragraph, the explanation of these tumors as possibly arising from organization of blood clots (Danyau and Goodhart) was quickly disposed of and need not be further considered. Likewise, the contention of Grafenberg and Hildebrandt that the condition is the result of degeneration and necrosis need be considered no further than to point out the unquestionable proliferative characteristics which have been noted by nearly all observers. Nebesky discusses this point in detail. As mentioned before, Storch in 1878 believed that the early stage of chorioangiofibroma was represented by hypertrophy of the villi

which he claimed was frequently found in the placentas of early abortions, and which he believed was the result of chronic endometritis. It is significant that endometritis was reported only once in this series (by Loennberg), and that careful examinations by other observers showed no evidence of inflammation of the fetal tissues or of the decidua attached to the placenta. Some years after Storch, Albert pointed out that since endometritis is usually widespread, one would not expect the involvement of only a very limited area of the placenta, or of only one placenta in the case of twins. On the other hand, little importance can be attached to the latter author's explanation that allantoic vessels growing out to the chorion may there find improper implantation with resulting excessive growth, since we now know that vascularization of the placenta is not from the allantois, nor by the outgrowth of umbilical vessels but by their development *in situ* (Schickele). Just as the endometritis theory is not supported by findings in the majority of cases, so the explanation of these tumors as inflammatory products (Loennberg, Von Mars and others) is not in accord with the facts, for rarely have evidences of inflammatory reaction been seen, and in certain very early cases they were reported as being absent (Alin and others). Even more improbable is the clinical deduction of Plauchu and Savy that we have to deal with an uncommon result of syphilis, for in only four cases has syphilis been mentioned, and several times it has been satisfactorily ruled out by both serological reactions and clinical evidence.

A number of observers, notably Labhardt and Kraus, have seen clumps of more or less adherent villi which resemble these tumors, especially since the vessels are frequently dilated, and Schickele believed that some tumors may develop in this way. Kraus, however, found that upon close examination the individual villi in such a picture could be distinguished by the more or less complete persistence of the epithelial covering. Moreover, as pointed out by Müller, these clumps are not sharply defined from the normal placental tissue, nor would it be possible for them to be attached by a thin pedicle alone as are so many true chorioangiofibromata. These clumps are commonly found in a zone surrounding large tumors and are conceivably the result of pressure from weight and expansive growth. They have also been found dispersed through a large part of the placenta in a condition discussed at length by Müller under the title of "angiectasis of chorionic ville." He found areas in which the villi were plastered together and angiectatic, due to stasis resulting from thickening of the vessel walls, with finally necrosis of the villi. In addition to this picture, one placenta showed an extensive inflammatory reaction. He quotes the case of von Franque, who called the condition "placentitis." Solowij has described a similar picture (hypertrophy compensatory to widespread infarction?); as have also Seitz and Schindler, except that the change is more limited in their cases. Certainly, there seem to be valid reasons to believe that none of

these changes could lead to the well-defined picture of chorioangiofibroma.

Many authors arguing upon the basis of a limited number of clinical, histological and experimental facts, have maintained the cause to be a circulatory disturbance, either of the maternal or of the fetal system. Dienst was the principal champion of the former after considering various hypotheses, and he concluded that during formation of the placenta hypertension in the maternal vessels promoted a protective hyperplasia on the part of certain villi which went on to tumor growth. An evident objection to this idea, besides the fact that such a reaction would be expected to be more widespread (Kermauner), is that the clinical histories would indicate only a small proportion of cases in which general or local uterine hypertension or other circulatory disturbance could be expected. More worthy, probably, of serious consideration from the etiological standpoint, is circulatory stasis in the fetal vessels from some cause. Some experimental basis for this hypothesis is found in the frequently mentioned work of Jores who produced angiomas, or at least angioma-like conditions, in the cat's liver by causing inflammatory venous obstruction and stasis. Likewise, Müller, as discussed above, found angiectasis of villous vessels following upon inflammatory thrombosis. Pitha advanced the idea that passive hyperemia might be caused by twisting or other distortion of the early villi. The idea of Schindler, Maxwell, and others that some defect of the cord vessels might lead to tumor formation is doubtful, for in that case stasis and its hypothetical effect (tumor formation) would be expected to be widespread in the placenta. These authors also believe, as do others, that the stasis might be from conditions existing in the placenta itself. Proliferation of endothelial cells, though denied by Oberndorfer, has been noted frequently and was thought by Beneke to be a possible cause of stasis in the placental vessels, so marked in certain areas as to lead to tumor formation. Van der Feltz and others thought that, among other causes, pressure from the frequently associated hydramnios might cause sufficient circulatory disturbance. However, as observed by Dienst, Kraus, and others, hydramnios might rather be considered as an effect than a cause. Nebesky believed that it would be more correct to say that stasis favored an angiomatous proliferation in the presence of an underlying predisposition. Kermauner, though admitting the possibility of hyperemia as a factor, believed the cause to be unexplained. It is interesting to note that Alin as early as 1890 seems to have considered these main hypotheses, for he says that he found no evidence of hemorrhage, degeneration, inflammation, or disturbance of circulation.

#### NATURE OF THESE TUMORS

Much conjecture and discussion have arisen in regard to the nature of the chorioangiofibroma. The early opinion of Virchow and that of

Valeri, which associated the condition with early forms of hydatidiform mole or chorioepithelioma now has no reasonable foundation. Other unlikely hypotheses of origin which have been discussed under other headings need not be mentioned further here, but rather will we be concerned with the question as to whether this epithelial covered mass of hypertrophied or proliferated chorionic connective tissue and blood vessels is a true tumor or not. Several writers, e. g., Storch, Merttens, and Guéniot speak of the condition as hyperplasia. Van der Feltz further denies the presence of the three characteristics of true tumors, i. e., (1) spontaneous genesis, (2) atypical tissue structure, (3) unbounded growth without typical termination. On the other hand, Dienst presents argument for spontaneous origin, for atypical structure if not atypical tissue elements, and for growth which is limited only by necrosis (as may occur in any tumor) and expulsion of the placenta. However, he believes that the point cannot be settled either way and supports the designation of tumor in the "wider sense." Gräfenberg argued upon the basis of the experimental production of angiomatous conditions in the liver by ligation of the hepatic vein that these, and likewise angiomata of the placenta, are not true tumors. It does seem that this experimental condition of the liver vessels represents only a dilatation and not a growth. However, the placental angiomata, contrary to Gräfenberg's contention that heaped up endothelial cells are the result of contraction of the vessel walls, have frequently shown a marked proliferation of endothelium as evidenced by reduplication of layers, numerous mitotic figures, and solid outgrowths becoming canalized to form new capillaries (Theuveny, Bertolini, and others). Certainly the process would seem from this to be one of growth rather than of degeneration as favored by him. Nebesky further calls attention to the frequent evidences of active new growth in the stroma as shown by its cellularity, which is sometimes of such a degree as to suggest sarcoma. He considers degenerative processes as secondary to primary tumor growth. Hauser, after a careful consideration of the evidence, was still undecided as to whether or not we had to deal with a true tumor.

#### CLINICAL ASPECTS

*Maternal.*—As has been pointed out by reviewers of this subject, there is little added danger to the mother because of the presence of chorio-angiofibroma. A review of the abnormalities of pregnancy, a summary of which has been given in an earlier section, shows that, with one exception, there are no disease conditions which are more frequent in this series than should be expected among a like number of average obstetrical patients. The exception is hydramnios which, however, with our present knowledge cannot be held as a condition particularly dangerous to the mother although it seems to predispose to the appearance of toxemia symptoms. There was no such association in this series. The



incidence of operative deliveries was not excessive,—10 per cent of the whole series or about 12.8 per cent of the cases where data concerning labor were given. From the evidence in this series there would seem to be a slightly added risk to the mother during the third stage of labor, for postpartum hemorrhage and operative removal of the placenta or tumor were each noted six times, and in four other cases manual removal of the placenta was necessitated by excessive bleeding. Albert noted this high incidence and believed that the increased size of the mass in the uterus due to the tumor prevented satisfactory uterine contractions. In this connection, it is to be noted that among these sixteen cases nearly all the tumors were very large including Dupin's and Chabaud's (780 grams). On the other hand a similar result might be ascribed to the effect upon the uterine muscle of the excessive distention by hydramnios, which was present here seven times.

*Fetal.*—Although some consideration must be given to the suggestion that the tumors which are associated with an important clinical finding or result would be more likely to be described, still such an explanation cannot be held as quite sufficient for the high incidence of prematurity and fetal mortality among the reported cases. Albert in 1898 in a review of 36 cases noted that only one-third of the children were normal. The others were stillborn, below normal weight, or premature and died within a few days. In six cases there was no record. Dienst found a gross mortality of 33 per cent among 39 cases of his collection in which the condition of the child was given. The usual cause of death he ascribed to asphyxia, though a review of the reports does not show how he came to this conclusion. Nebesky and Sadewasser state the mortality as being about 35 to 40 per cent. Such figures correspond with those obtained from the larger series here given, for 41 children were stillborn or died in early infancy, a mortality of 31.3 per cent for the whole series, or 37.6 per cent for the 109 children about which data were given. Nebesky believed that the situation of the tumor in relation to the cord had no bearing upon fetal death, and this opinion is supported by the fact that there is no increase in the mortality (32.1 per cent) among the 28 cases of this series in which the tumor was under or adjacent to the insertion of the cord. He further believed that the prognosis for the child was not affected so much by the size of the tumor as by the amount of remaining healthy placental tissue, and whether or not this was sufficiently free of pressure for adequate function. However, in the placentas of 76 of the above mentioned 109 children there was a large amount of tumor tissue (size of a hen's egg or greater), and the gross mortality was slightly but definitely increased (39.5 per cent) over that for the remaining 33 (33.3 per cent). Moreover, an opinion regarding prognosis upon the basis of the proportion of the remaining and functioning placental tissue does not permit of more than conjecture because of the insufficient detail of the data which

are available. The results of the six cases in which the weights of both the tumor and placenta are stated give only suggestive evidence in support of this view. (See Table II.) In this connection it is interesting to note that Auvard (1887) attributed both the size of the tumor and the prognosis for the child to the varying degree of vascular stasis in the placenta.

TABLE II

CLINICAL RESULTS IN SIX CASE REPORTS IN WHICH WEIGHTS OF BOTH THE TUMORS AND THE PLACENTAS WERE GIVEN

AUTHOR	TUMOR GRAMS	PLACENTA GRAMS	APPROX. RATIO	DEVELOPMENT	HYDRAM- NIOS	RESULT
Roscher	150	1700	1/11	Term (?)	no	Living
Theuveny	80	650	1/8	Term	no	Living
Ravano	75	450	1/6	Premature	yes	Died
Trillat	400	1130	1/3	Term	no	Living
Calderini	335	790	2/5	Premature	yes	Stillborn
Pulverenti	740	712	1/1	Term	yes	Asphyxia pallida.

It was thought that a study of this series might give more definite information in regard to fetal mortality than had been obtained from previous and smaller collections. As stated before, there were 109 children concerning whom there was sufficient information for statistical use, and in Table III the data in regard to the most important factors are tabulated. The relative infrequency of other possible factors (twins 5 times, developmental anomalies 4 times, and syphilis 3 times) and their general distribution throughout the series makes consideration of them unnecessary. However, it should be borne in mind that a larger proportion of autopsies and our later methods of diagnosis might possibly have made a substantial difference in the frequency of the last two conditions.

On examination of the data in Table III we see that among the 109 children there were an unusually large number which were premature, 35, or 32.1 per cent, and as should be expected a large proportion of these premature children died, 24, or 68.6 per cent. Here, then, in the unusual incidence of prematurity with its expected high mortality we have some explanation for the large percentage of deaths in the whole group, for of the 41, or 37.6 per cent. who perished, 24, or 58.5 per cent, were premature. Moreover, it should be mentioned that the incidence of prematurity in this tabulation is no doubt really too low, since children were considered as premature only when designated as such by the authors, or when the weight (below 2500 grams) and length (less than 45 centimeters) definitely indicated prematurity. Consequently, the rather high mortality (23 per cent) among those listed as term children may well be due in part to the inclusion in this group of some dead premature children along with those about which the information

TABLE III

INCLUDES ALL CHILDREN ABOUT WHICH THERE WERE SUFFICIENT DATA FOR STATISTICAL PURPOSES AND SHOWS THE FETAL DEATHS TO BE MAINLY AMONG THE PREMATURE CHILDREN, PREMATURITY IN TURN BEING ASSOCIATED WITH A HIGH INCIDENCE OF HYDRAMNIOS

ALL CHILDREN WITH DATA			TERM CHILDREN		PREMATURE CHILDREN	
	NO.	PER CENT	NO.	PER CENT	NO.	PER CENT
Whole Group	109	100	74	67.9	35	32.1
With Hydramnios	40	36.6	15	20.3	25	71.4
Without Hydramnios	69	63.3	59	79.7	10	28.6
Operative	14	12.8	8	10.8	6	17.1
Spontaneous	95	87.2	66	89.2	29	82.9
I. Survived	68	62.4	57	77	11	31.4
a. With Hydram.	16	23.5	11	19.3	5	45.5
b. Without Hydram.	52	76.5	46	80.7	6	54.5
c. Operat. del.	3	4.4	2	3.5	1	9.1
d. Spont.	65	95.6	55	96.5	10	90.9
II. Died	41	37.6	17	23	24	68.6
a. With Hydram.	24	58.5	4	23.5	20	83.3
b. Without Hydram.	17	41.5	13	76.5	4	16.6
c. Operat. del.	11	26.8	6	35.3	5	20.8
d. Spont.	30	73.2	11	64.7	19	79.2

was insufficient, but which were classed as being at term because not proved otherwise.

It is further seen in Table III that hydramnios had an unusual incidence, for of the 109 children 40, or 36.6 per cent, were associated with an excessive amount of amniotic fluid. Of these 40 children 24 perished. But, it is then noted that the majority (25, or 62.5 per cent) of the children associated with hydramnios were premature, which number represents 71.4 per cent of the premature group, whereas only 15, or 20.3 per cent, of the term children were accompanied by an excessive quantity of amniotic fluid. This disproportion in the occurrence of hydramnios was perhaps really greater than here stated as it is likely that some children associated with hydramnios and placed in the term group were premature but not recognizable as such according to the criteria employed, as outlined in the preceding paragraph. From the data available, there is no reason to believe that hydramnios in itself and directly was the cause of fetal deaths, for the children of the term group associated with an excessive quantity of amniotic fluid had a death rate (26.6 per cent) very little greater than that for the whole group (23 per cent). However, there was obviously an indirect effect in that the high incidence of hydramnios associated with these tumors resulted in an increased occurrence of premature births with the consequent high fetal mortality.

Pursuing this idea further and making use of an hypothesis, as will be explained subsequently, concerning the relation of the size of the tumors to the incidence of hydramnios, it was possible to derive two subgroups from the main series. In Table IV are given the data in regard to 76 children which were associated with large tumors, i. e.,

size of a hen's egg or larger, and Table V concerns the 27 children associated with small tumors—those smaller than an egg. Further division could not be accomplished due to insufficient detail in regard to the size of the tumors. In six the dimensions of the tumors were not given, and these are eliminated from consideration at this place. With the small tumors (Table V) it is seen that hydramnios occurred only three times (11.1 per cent), prematurity six times, or 22.2 per cent, and the mortality was 37.1 per cent. In contrast, with the large tumors (Table IV) hydramnios was present in 48.7 per cent, prematurity in 34.2 per cent, and, as was expected, the mortality was higher (39.5 per cent). See Chart I, part marked "Uncorrected."

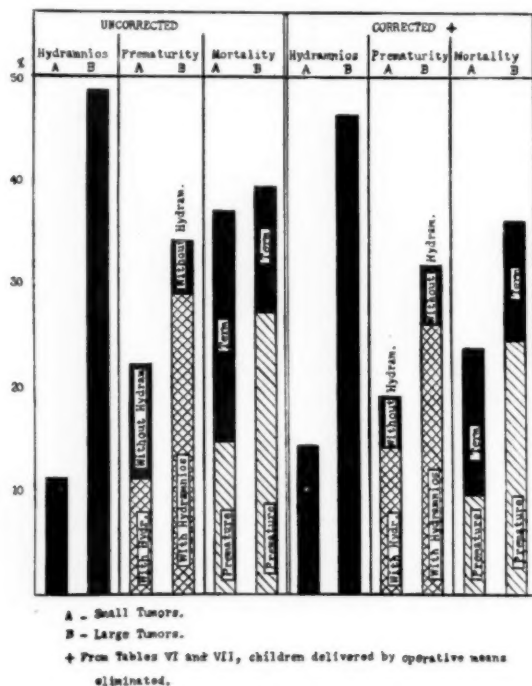


Chart I.

The difference in the results for the groups associated with small tumors and with large tumors was emphasized when we took into account and made special consideration of the next most important cause of fetal deaths, namely, operative delivery, which, though not excessively frequent, was attended by the extremely high mortality of 78.6 per cent, or 26.8 per cent of the mortality for the whole group. There was no reason to believe that interference with labor or the associated fetal deaths were consequent upon other than the usual obstetrical conditions. Certainly there were no data to indicate that either the tumors themselves or the hydramnios played any part as a cause of dystocia. Consequently as such a large proportion of children associated with small



tumors were delivered by operation, and as the impression in regard to the influence of the tumors was thus distorted by the presence of operative deaths, it was decided to eliminate all children delivered by operation from Tables IV and V. Tables VI and VII are the result, and here the incidence of hydramnios, prematurity, and fetal deaths

TABLE IV  
DATA IN REGARD TO 76 CHILDREN, FROM TABLE III, WHICH WERE ASSOCIATED WITH LARGE TUMORS,—SIZE OF HEN'S EGG OR GREATER

CHILDREN ASSOCIATED WITH LARGE TUMORS			TERM CHILDREN		PREMATURE CHILDREN	
	NO.	PER CENT	NO.	PER CENT	NO.	PER CENT
Whole Group	76	100	50	65.8	26	34.2
a. With Hydram.	37	48.7	15	30	22	84.6
b. Without Hydram.	39	51.3	35	70	4	15.4
c. Operative del.	7	9.2	3	6	4	15.4
d. Spont. del.	69	90.8	47	94	22	84.6
Survived	46	60.5	40	80	6	23.1
a. With Hydram.	15	32.6	11	27.5	4	66.7
b. Without Hydram.	31	67.4	29	72.5	2	33.3
c. Operative del.	2	4.3	1	2.5	1	16.7
d. Spont. del.	44	95.7	39	97.5	5	83.3
Died	30	39.5	10	20	20	76.9
a. With Hydram.	22	73.3	4	40	18	90
b. Without Hydram.	8	26.7	6	60	2	10
c. Operative del.	5	16.7	2	20	3	15
d. Spont. del.	25	83.3	8	80	17	85

TABLE V  
DATA IN REGARD TO 27 CHILDREN, FROM TABLE III, ASSOCIATED WITH SMALL TUMORS

CHILDREN ASSOCIATED WITH SMALL TUMORS			TERM CHILDREN		PREMATURE CHILDREN	
	NO.	PER CENT	NO.	PER CENT	NO.	PER CENT
Whole Group	27	100	21	77.8	6	22.2
With Hydram.	3	11.1	0	0	3	50
Without Hydram.	24	88.9	21	100	3	50
Operative del.	6	22.2	4	19	4	66.7
Spont. del.	21	77.8	17	81	2	33.3
Survived	17	63.9	15	71.4	2	33.3
With Hydram.	1	5.9	0	0	1	50
Without Hydram.	16	94.1	15	100	1	50
Operative del.	1	5.8	1	6.7	0	0
Spont. del.	16	94.1	14	93.3	2	100
Died	10	37.1	6	28.6	4	66.7
With Hydram.	2	20	0	0	2	50
Without Hydram.	8	80	6	100	2	50
Operative del.	5	50	3	50	2	50
Spont. del.	5	50	3	50	2	50

was respectively 46.4 per cent, 31.9 per cent, and 36.2 per cent for the large tumors in contrast to 14.3 per cent, 19.1 per cent, and 23.8 per cent for the small tumors. These conclusions are shown graphically in Chart I, part marked "Corrected."

Thus, it is evident that the high fetal mortality associated with these

TABLE VI

DATA IN REGARD TO 69 CHILDREN ASSOCIATED WITH LARGE TUMORS FROM TABLE IV  
DERIVED BY ELIMINATION OF THOSE DELIVERED BY OPERATIVE MEANS

GROUP	NO. PER CENT		TERM CHILDREN		PREMATURE CHILDREN	
	NO.	PER CENT	NO.	PER CENT	NO.	PER CENT
Whole Group	69	100	47	68.1	22	31.9
With Hydram.	32	46.4	14	29.8	18	81.8
Without Hydram.	37	53.6	33	70.2	4	18.2
Survived	44	63.8	39	82.8	5	22.7
With Hydram.	14	31.8	11	28.2	3	60
Without Hydram.	30	68.2	28	71.8	2	40
Died	25	36.2	8	17.2	17	77.3
With Hydram.	18	72	3	37.5	15	88.2
Without Hydram.	7	28	5	62.5	2	11.8

TABLE VII

DATA IN REGARD TO 21 CHILDREN ASSOCIATED WITH SMALL TUMORS FROM TABLE V  
DERIVED BY ELIMINATION OF THOSE DELIVERED BY OPERATIVE MEANS

GROUP	NO. PER CENT		TERM CHILDREN		PREMATURE CHILDREN	
	NO.	PER CENT	NO.	PER CENT	NO.	PER CENT
Whole Group	21	100	17	80.9	4	19.1
With Hydram.	3	14.3	0	0	3	75
Without Hydram.	18	86.7	17	100	1	25
Survived	16	76.2	14	82.4	2	50
With Hydram.	1	6.3	0	0	1	50
Without Hydram.	15	93.7	14	100	1	50
Died	5	23.8	3	17.6	2	50
With Hydram.	2	40	0	0	2	100
Without Hydram.	3	60	3	100	0	0

tumors is chiefly accounted for by the very large number of premature children, these having the usual high death rate which occurs with imperfect development. Furthermore, it is seen that hydramnios has a very high incidence, and the percentages of prematurity and fetal deaths that accompany this condition are sufficiently increased to explain their high incidence in the whole group. For the term children with hydramnios, the mortality is not appreciably greater than for the whole group of fully developed babies. We are, therefore, led to the conclusion that the high fetal mortality concomitant with these tumors is largely a consequence of premature birth, the occurrence of which is increased as a result of the frequency of hydramnios. This conclusion is also supported by the fact that, with the higher percentage of hydramnios associated with the larger tumors, there is an increased fetal death rate which falls entirely into the correspondingly enlarged group of premature children.

## HYDRAMNIOS

Just as little attention in the literature has been directed toward the important association of fetal mortality with premature birth and hydramnios, so the relation of hydramnios to these tumors has been pre-

vously largely overlooked or neglected. Except for Nicolini in 1882, most authors have done little more than make mention of the high incidence of an excessive quantity of amniotic fluid in association with chorioangiofibromata. The relatively large collection of cases here given offers an opportunity to obtain some statistical facts which lead to interesting deduction and speculation regarding the origin of hydramnios in general and in connection with these tumors.

As mentioned before, hydramnios or an increased amount of amniotic fluid occurred in 36 (32.7 per cent) of the 110 pregnancies about which data is given. Comparable with these figures is the association of 40 children with excessive amniotic fluid, the difference between 36 and 40 being due to multiple pregnancy. In nine of these 36 pregnancies there occurred abnormalities which are frequently accepted as probably having some relation to hydramnios: twins, uniovular (or probable) 4 times, once with fetal anomaly; albuminuria alone twice, with cardiac abnormality of mother and child once; syphilis proved or questionable twice. However, in the remaining 27 pregnancies, or 75 per cent, none of these usually given causes of hydramnios, presumptive as they are, were found.

Further consideration shows that these cases with hydramnios can be conveniently divided into two groups according to the size of the tumor, i. e., smaller than a hen's egg or as large or larger. By this grouping we should obtain an indication of the effect of the size of the tumor in relation to hydramnios, and it is interesting to note that only three of these 36 pregnancies with hydramnios were associated with small tumors, while large tumors were present in 33 or over 90 per cent. In addition, it was found that the 27 pregnancies noted in the preceding paragraph as not accompanied by any of the usually given causes of hydramnios, were all associated with large tumors. In Tables IV, V, VI, VII and Chart I is shown the relation of the size of the tumor to the incidence of hydramnios with its consequences of premature birth and high fetal mortality.

From this evidence it seems fair to assume that chorioangiofibromata play an important part in the excessive production of amniotic fluid in the large proportion of the pregnancies with which they are associated, the percentage increasing definitely with the increase in size of the tumor masses. From the information at hand we can do nothing more than speculate upon the influence exerted by these tumors upon the mechanism of amniotic fluid formation, or rather upon the more probable hypothetical mechanisms. According to the information now available, it seems likely that normally the amniotic fluid originates mainly from the maternal vessels but is introduced into the amniotic cavity through secretory activity of the amniotic epithelium. Perhaps a small part of the fluid may be derived as a transudate from the umbilical cord or from the skin of the fetus. In cases of hydramnios

it appears that the excessive fluid may often have a different origin,—attributable to various abnormalities of mother or fetus. One of the most frequent abnormalities is obstruction in the fetal-placental circulation with production of fluid from the fetal source. It is readily conceivable that a tumor might press upon sufficient placental vessels to cause marked obstruction in the venous circulation through the placenta and fetus. Such obstructions when caused by a condition present in the umbilical cord seem to lead directly to increased secretion by the fetal kidneys, and no doubt obstruction in the placenta would give the same result. Likewise such stasis might well result in increased exudate from the umbilical cord itself. Or, stasis and hyperemia in the placental circulation distal to the tumor might lead to excessive production of fluid from the overlying amniotic surface. Another possibility for excessive production of fluid from a placental source is seen in the additional amniotic surface due to the volume of the tumor itself, this secreting surface overlying an extremely vascular tissue.

From the data obtained in this series of tumors there is nothing, other than size, which is apparent as a factor in the production of the frequently associated hydramnios. Nor do we know why some of the large tumors are accompanied by hydramnios and others by a normal quantity of fluid or even oligohydramnios, as is indicated by the report of Eggel. There seems to be no connection between the situation of the tumors upon the placentas and the incidence of excessive amniotic fluid.

#### SUMMARY

Chorioangiofibromata are very rare solid tumors of a characteristic structure which originate from the connective tissue, epithelium, and blood vessels of the placental chorion. Their etiology and nature are yet uncertain. They have little effect upon the prognosis for the mother, but by their effect upon the production of hydramnios tend to cause premature birth with a consequent high death rate of the children. This excessive production of amniotic fluid with its result upon the fetal mortality is most frequently associated with the larger tumors.

In conclusion I wish to express my thanks to Dr. B. H. Larsson and others for their kind assistance in preparation of the literature. To Dr. J. Whitridge Williams, Dr. F. W. Hartman, and especially to my chief, Dr. E. D. Plass, I am deeply indebted for valuable advice and assistance which has made this study possible.

Since the completion of this article Strachan has published a more detailed description of his tumor in the *British Journal of Obstetrics and Gynecology*, 1923, iii, No. 3, 433-437. Santer also has added an interesting tumor and case report ("Beitrag zur Klinik der Chorionangiome," *Archiv für Gynäkologie*, 1923, exix, 454-458). He states that he was able to find only 95 of these tumors reported. Other recent articles on this subject have appeared as follows: *R. M. Page*: "Chorio-angioma Case," *Virginia Medical Monthly*, March, 1924, 1, 821. *G.*

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## NEPHRALGIA WITH HIGH BLOOD PRESSURE\*

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THE term nephralgia has been given to a small but important group of cases, characterized by intense pain in the region of the kidney but without any apparent pathologic cause for the colic. Numerous cases have been reported of renal pain with hematuria, others of hematuria without pain, and to these somewhat allied conditions the various names of essential hematuria, idiopathic renal hematuria and angioneurotic bleeding kidney have been given.

This latter group of cases characterized by pain associated with hematuria, or by hematuria alone has been growing rapidly of late years, as reports have come in from various clinics, but the group of true nephralgias is very small and comparatively few cases have been observed and it is because of the wide divergence of opinion as to the etiology, pathology and treatment of these cases that this report is made.

In January, 1919, the patient, a trained nurse, thirty-four years of age, was admitted to the hospital with acute renal colic. There was a bad family history, the mother having died at the patient's birth with eclampsia, at the age of thirty-three, and the father at the age of forty-six with "kidney trouble." In some few years prior to admission, the patient had had several attacks strongly suggesting angioneurotic edema. Her first attack of renal colic was in 1915, but was mild compared with the subsequent ones and in 1918 she was off duty several weeks with more or less constant pain referred to the left kidney. One of the most striking features of this case was the persistent high blood pressure varying between 240/140 and 200/110 during her stay in the hospital and until the decapsulation of the kidney nearly a year later, and it is an interesting fact that there are almost no blood pressure observations recorded in the nephralgia cases. During her stay in the hospital under medical treatment, every possible test was made to find some pathologic basis to explain her intense colic. There was always a slight trace of albumin and a few casts in the urine. The kidney pelves were normal in capacity. The functional test of the two kidneys was the same. The x-rays were always negative for stone or neoplasm. The pain during the attacks was constant in the left kidney region and did not tend to radiate. This pain was so severe that it did not yield to morphia in large doses and was controlled only with gas and chloroform. After several weeks under medical treatment, she was able to leave the hospital and resume her duties until October, 1919, eight months later, when on entering the hospital, one morning, to go on duty, she became suddenly blind, and was seized with intense nausea and violent left-sided renal colic. These symptoms rapidly became worse and at times during an attack of pain there would be a complete suppression of the urine lasting as long as 48 or even 60 hours. The colic sometimes stopped as suddenly as it had begun and then there would be

\*Read at the Forty-ninth Annual meeting of the American Gynecological Society, Hot Springs, Va., May 15-17, 1924.

excessive voiding, as much as 1500 c.c. being excreted in an hour. This alternate suppression of the urine and excessive voiding made us think that we were dealing mainly with an agnionurosis of the kidney or at least a process in which vascular spasm played an important part.

In the hope of relieving her it was decided to do a decapsulation. When exposed, the left kidney was found to be grayish in color, larger than normal, somewhat adherent to the perirenal capsule, in fact it was the typical large gray kidney of an early interstitial nephritis. The pelvis and ureter were normal. There were two aberrant veins entering the kidney and these were ligated. When a small nick was made in its capsule, the kidney was under such great tension that the capsule split rapidly open for its entire length and the kidney peeled out.

Following the decapsulation the patient recovered rapidly and was able to resume her duties in a very short time. One of the most striking results of the operation was the rapid fall in the blood pressure, the systolic dropping to 150 and remaining at this point until recently, when it has again risen, probably owing to her nephritis.

We have had an opportunity in this case of observing the changes in the left kidney, four years after the original operation. A few weeks ago, this same patient was again admitted with a return of the left-sided renal pain, and these attacks continuing, she was again explored and at the second operation the kidney capsule was found densely adherent and very much thickened, while the kidney itself had changed from the large, gray, soft type to the small, red, contracted or sclerotic kidney of interstitial nephritis. Secondary decapsulation brought about very little effect, the blood pressure dropping for a short time but the old pain returning about three weeks after the second operation.

*Etiology.*—It has long been recognized that many of the cases in the nephralgia group are associated with chronic interstitial nephritis and many of the kidneys removed for this condition have shown a general interstitial nephritis or nephritis in patches. We know that occasionally nephritis may be confined to one side and is not correctly diagnosed because of the absence of albumin and casts in the urine.

Sabatier, in 1889,<sup>1</sup> was among the first to realize that nephritis was the causal factor in nearly all of the cases of the so-called idiopathic renal haematurias. Then in rapid succession came reports from Israel,<sup>2</sup> Albarran,<sup>3</sup> Rovsing,<sup>4</sup> Zuckerkandl,<sup>5</sup> Fowler,<sup>6</sup> and many others endorsing this view.

Bleek,<sup>7</sup> in 1909, reported on eighty cases of which over fifty showed evidences of true nephritis, while Barringer,<sup>8</sup> in 1912, out of twenty-five cases in which nephrectomy had been done for idiopathic hematuria found that twenty-three showed a definite nephritis.

In spite of the preponderance of evidence from many authorities as to the nephritic origin of these cases, a second group of eminent urologists, Senator,<sup>9</sup> Atlee,<sup>10</sup> Guthrie,<sup>11</sup> and others, maintain that many of these kidneys show no signs of nephritis at all and that the condition is due to a hereditary hemophilia, although, if this be conceded, it is difficult to understand the relief obtained by operation, and if their hypothesis is correct, we should expect to find these cases occurring earlier in life, rather than at the third and fourth decades, when they are most common.

A third group holds the theory that an angioneurosis is the basic factor in these cases, and that it may play an important part is quite evident from the case here presented with its alternating attacks of anuria and excessive voiding which were unquestionably due to a condition of vascular spasm.

We find reports of still other cases of severe renal colic, cured by appendectomy, although it is difficult to understand just how a diseased appendix could cause a persistent hematuria.

Hunner has had cases of a similar character due to ureteral stricture, while in other instances varices of the renal pelvis, ruptured vessels in the kidney and aberrant veins are occasionally found. Randall,<sup>12</sup> in 1913, argued that a congestion was the principal factor in the etiology, whether caused by nephritis, varicosities or ruptured vessels in the kidney pelvis. The large number of cases recorded, however, seems to prove that the majority of the idiopathic hematurias and nephralgias are due to a one-sided nephritis.

*Pathology.*—Although opinions differ widely as to the underlying cause of the hemorrhage and pain, there are constantly found gross pathologic lesions other than the changes in the renal parenchyma. Marked thickening of the kidney capsule, dense adhesions about the ureter and inflammatory processes affecting the renal plexus of nerves and its filaments, as they accompany the renal vessels, are quite commonly found.

In a recent paper Papin and Ambard<sup>13</sup> have described minutely the nerve supply to the kidney and pelvis, and as one considers the elaborate innervation of this organ, with a fine nerve plexus surrounding each of the vessels, even as far as the vascular tuft of the glomerulus and other branches running to the uriniferous tubules, one cannot help but wonder at the infrequency of kidney pains, especially in an organ subject to almost constant activities.

Lennander,<sup>14</sup> is firm in the opinion that the pain in nephralgia is entirely due to pressure within the capsule of the kidney and as proof of this points to the great relief afforded by decapsulation. Israel agrees with Lennander, whereas Senator<sup>15</sup> argues that misplacements, inflammatory adhesions and aberrant vessels are constantly found and that the pain is due to causes other than the congestion and pressure in the capsule.

Geraghty,<sup>16</sup> reporting recently on a series of eighteen cases of nephralgia found no constant lesion and has proposed the name of *idiopathic nephralgia* because of the absence of any definite pathologic lesion. He saw our patient several times in consultation and regards her case as a very unusual one.

*Symptoms.*—The characteristic symptom in all of these cases is pain, at times dull and aching, at other times sharp, excruciating, and exceeding in certain cases the most severe forms of kidney colic due

to stone. The pain is generally referred to the kidney and may stay confined to it or radiate down the course of the ureter. It may be constant, lasting over a period of many hours, or there may be shorter paroxysms. The bleeding may be intermittent, often occurring without accompanying colic; or it may last over long periods.

*Diagnosis.*—The diagnosis in these cases is not simple and should be made only after the most painstaking efforts and after every other possible cause for the bleeding and pain has been eliminated. Ureteral stricture, stone in the kidney or ureter, tuberculosis, neoplasm, hydro-nephrosis and pyonephrosis must be excluded. The x-ray and pyelogram, injection of the kidney pelvis, the wax tipped catheter, tuberculin tests and the differential examination of the urine from the two sides are all of value in determining the cause of the hematuria.

When the diagnosis has finally been made by the process of elimination, we still have to decide upon the proper operative procedure.

As diverse as they are in their opinions as to the etiology of nephralgia, just so widely do the various authorities differ in their mode of treatment.

Decapsulation by the Edebohls method, nephrotomy, nephrolysis or freeing of the kidney and ureter of adhesions, adrenalin injections into the pelvis in the bleeding cases, and sectioning of all the nerve trunks supplying the kidney, have been used in various clinics with success. The most widely practiced procedure is the Edebohls decapsulation which has been followed by cures in many instances.

Israel reports numerous cases relieved permanently by nephrotomy, and at times has left the kidney open to heal by granulation.

Geraghty and Frontz have pursued the method of freeing the kidney and ureter of all adhesions as far down as possible, and report a number of cures from this procedure, although here again it is difficult to understand why cases are benefited when the pain is due to congestion and tension of the kidney in its capsule.

Recently, Papin<sup>17</sup> has reported a series of twenty-seven cases, in all of which the pain was permanently relieved by severing the renal nerves. The pedicle of the kidney is exposed, the nerve filaments accompanying the vessels are searched out and torn across, and although the patient suffers much more than after the ordinary kidney operation, the ultimate results in Papin's hands have been excellent.

In conclusion, this paper has been presented in the hope that this unusual case of nephralgia, with its typical nephritis, intense congestion of the kidney in its capsule and its unquestionable attacks of vascular spasm, might help to throw some light on the real etiology of a condition at present little understood. Various methods of treatment have been used with success, but the weight of evidence seems to be that nephrectomy is never justifiable and that the best results



will be obtained by the combined operation of decapsulation and thorough freeing of the kidney and ureter.

Several points in the present case are of great importance; (1) A true angioneurosis may occur, the vascular spasm causing a complete anuria of many hours' duration; (2) congestion plays a large and probably most important part in causing the pain in these cases; (3) decapsulation gives temporary relief, at least in the severe type of nephralgia, and in some instances may effect a permanent cure.

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13 CHASE STREET WEST.

(For discussion see page 652.)

## FUNCTION OF THE OVARY\*

## B. FOURTH PAPER: ADVANCES BETWEEN 1911 AND 1924

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IN the discussion following the reading of my first paper before this Society in 1911, at least three members voiced their doubts concerning the validity of proof offered to substantiate my theme, which was that the ovary is a gland of internal secretion. This uncertainty was, doubtless, due to the fact that the huge mass of evidence and literature, which had accumulated, had proved disconcertingly conflicting. In the thirteen years which have elapsed, much additional evidence has been gathered. I believe that today, I can analyze the various problems at issue with greater lucidity, brevity and convincingness than heretofore. In this brief review I shall refer only to such works and authors as are directly concerned in linking up my chain of proof. Fuller references to the literature can be found in many books and articles of which I instance only Biedl, Wolff, Marshall, etc.<sup>1</sup>

My first paper<sup>2</sup> dealt mainly with the physiology of the sex cycle and afforded additional substantiation of the splendid work performed by Leo Loeb<sup>3</sup> in which he showed (a) that the embedding of the ovum necessitated, as a prerequisite,

\*Prepared for, but not read at, the meeting of the American Gynecological Society, May 15, 1924, Hot Springs, Virginia.

the "sensitization" of the uterine mucosa by the corpus luteum (formation of deciduomata when irritated by a foreign body, in other words a maternal placental reaction), and (b) that the corpus luteum governed the periodicity of the sex cycle by inhibiting follicle ripening.\*

In 1914<sup>4</sup> I tried to apply to the human subject, with all due reservations, the knowledge gained from physiologic observations and pathologic conditions. The gist of our acquirements showed that although each gland of internal secretion may possess a specific action, this action, if in a given case it does influence the sex sphere, documents itself only in one of two ways by directly reacting upon the ovaries so as to produce either genital hyper- or hypo-function.

In 1917<sup>5</sup> I offered proof (a) that lipoid extracts obtained from the corpus luteum or the placenta could produce massive hyperplasia of the internal and external genital apparatus and of the mammary glands, in castrated animals (for lit. see<sup>5</sup>). I also showed (b) that these results could be obtained in animals deprived of their adrenal, thyroid or pancreas. And finally I drew attention to the fact (c) that the visible increase of mammary gland and nipple in the rabbit offered *in vivo* a convenient pharmacologic test of the potency of ovarian products.

Since then, in 1922<sup>6</sup> I have published elsewhere results obtained as early as 1917, in which I proved that a similar growth producing effect on the uterus, vagina and breasts could be obtained *by the injection of follicle fluid*. These experiments have more recently been repeated and amplified.<sup>7</sup> Quite recently Allen and Doisy<sup>8</sup> have not only confirmed my results, but found that the active principle of the follicle secretion follows the lipoid fraction, just as has been shown that it also does in corpus luteum and placental extracts.

The above-mentioned experimental proofs, together with much additional evidence, of which I need mention only the appearance of rut in bitches injected with the blood of rutting bitches (Marshall<sup>9</sup>)—showing the presence of a hormone in the circulating blood; the persistence of rut in ferrets who harbor persistent follicles (Robinson<sup>10</sup>)—showing that the follicle secretion maintains estrus; the suppression of estrus in cows while a corpus luteum persists, and the immediate resumption of the cycle when the corpus luteum is squeezed out—showing the inhibiting effect of the corpus luteum—allow us to analyze the sex cycle both in animals and in the human female.

#### ANALYSIS OF THE SEX CYCLE

(a) *The follicle*, in mammals, elaborates a substance which produces a growth stimulus on the uterus, vagina and mammary glands.

\*To whom the credit for determining the function of the corpus luteum is due, has given rise to considerable controversy. The names of Beard (1897), Prenant (1898), Born and later Fraenkel are associated with the first discovery. Fraenkel showed that the corpus luteum is necessary for nidation. His assertion that the yellow body *caused* menstruation was a fruitful source of confusion and error. Not until Loeb analyzed the two main functions of the corpus luteum was this misconception finally laid to rest.

This effect may occur *in utero*, certainly takes place throughout childhood, and becomes strikingly manifest at puberty. When circulating in sufficient concentration, the follicle hormone causes the pregravid changes known in animals as proestrus and estrus, and in the human female as the "premenstrual" change.

Marshall, 1903,<sup>9</sup> injecting blood of estrual bitches obtained estrual changes in other bitches.

Bucura, 1907<sup>11</sup> found the nutrition of the uterus in a rabbit preserved by a fragment of ovary containing only a few follicles.

Frank, 1922,<sup>6</sup> showed the pharmacologic effect of injecting fresh follicle fluid.

(b) *The corpus luteum* during its stage of activity, which is far shorter than its actual anatomic persistence (see Loeb) continues and accentuates the growth effect on the uterus, vagina and breasts, thus enabling the genital tract to meet the growth and nutritional requirements of early pregnancy.

As Loeb<sup>3</sup> has shown, the ovum is enabled to embed because the "sensitized" uterine mucous membrane reacts to any foreign body by forming the maternal part of the placenta. The nutritional rôle of the glycogen containing decidua may be referred to in passing (Ritter<sup>12</sup>).

The inhibition of follicle ripening during pregnancy, due to the functional persistence of the corpus luteum (Loeb) may be regarded as a conservative measure which prevents follicle waste and inhibits the periodic genital engorgement which might prove disastrous to the growing ovum.

(c) *The placenta*, as has been shown, (lipoid extracts, Iscovesco, etc.,<sup>13</sup> physiologic, Halban) helps to maintain the continued increase in the growth of the uterus and breast, as initiated by the follicle and corpus luteum, by producing additional muscle hypertrophy in the uterus and gland hyperplasia in the breasts. As an accessory function the placenta inhibits milk secretion (Halban,<sup>14</sup> Frankl<sup>15</sup>).

Not only do injection experiments show the effect of the placental action on uterine muscle hyperplasia (see<sup>12</sup>) but clinically the same effect is found in hydatid mole without fetus thus proving that the embryo does not exert this action.

Until a retained placenta is expelled, milk secretion does not take place. Frankl's<sup>15</sup> recent striking experiments on mice confirm this clinical observation.

(d) The sex cycle in the higher apes and in the human female differs somewhat from that of the lower mammals because the function of *menstruation* has developed.

As in other mammals, the follicle secretion initiates the "premenstrual" (better designated as "pregravid") change which consists of the division of the mucosa into the compact and spongy (functional) layers, the basal layer remaining unchanged.

If pregnancy does not occur, the "functional" layers necrose when the corpus luteum becomes functionless, and then exfoliate (Schroeder, Lindner<sup>16</sup>). Bleeding, both from the raw surface lining part of the

interior of the uterus, as well as through the intact edematous mucosa, persists as long as the pelvic hyperemia continues. This bleeding is known as menstruation.\*

Schroeder<sup>16</sup> has shown conclusively that the exfoliation is not an artefact, by demonstrating it in many excised uteri. Lindner<sup>16</sup> has found fragments of mucosa as a regular content of the menstrual discharge.

Some investigators<sup>17</sup> have tried to explain the menstrual bleeding by changes in the coagulability of the blood resulting from ferment action of the mucosa. These demonstrations are unconvincing.

That the decidual change and uterine hyperplasia is independent of changes in the condition of the pelvic circulation was proved by Loeb<sup>3</sup> who obtained the reaction in transplanted uteri by the action of the functioning corpus luteum, as well as by myself<sup>5</sup> who, upon injecting placental extracts, also obtained hyperplasia of transplanted uterine tissue.

(e) *The periodicity of the sex cycle* after the menstrual function has been established, is governed by the power of the corpus luteum to inhibit follicle ripening. It is not known what factors produce the onset of puberty.

Ablation of the corpus luteum has been shown to shorten the cycle (Loeb), because a new crop of follicles at once begins to develop. As previously mentioned persistence of the corpus luteum postpones estrus. Removal of a corpus luteum at operation is often followed by too early menstruation when the pregravid activation of the mucosa has already taken place, because the nutrition-maintaining influence of the yellow body upon the mucosa is abruptly removed. (Vértes<sup>18</sup>).

(f) *Ovulation must occur before the anticipated menstruation*, because only the pregravid uterine mucosa can successfully harbor a fertilized ovum. The dates, as obtained in the human female, both at operation and autopsy, show that ovulation can occur between one to eighteen days after the cessation of the menses (Meyer, Meyer and Ruge, Schroeder,<sup>10</sup> etc.). This signifies that in the human female, in contrast to the lower mammals, the time of ovulation is variable and may fall to within one week of the expected period.

The loss of this fixed relation between ovulation and proestrus (pregravid change) in the human species, might correspond to the fact that in the human female coitus is accepted throughout the cycle.

In animals ovulation bears a fixed relation to estrus, though great differences exist in different species—as a few hours in guinea pig, dog and cow to several months in the bat—and coitus is limited to the time of estrus.

(g) *The interstitial gland* ("puberty gland" of Steinach) is inconstant in the same individual (seasonal variations) and absent in many species. Its derivation is ascribed to connective tissue by some (Limon<sup>20</sup>), to the follicle epithelium by others (Lane-Claypon<sup>21</sup>).

\*Marshall (l. c., p. 156) is unwilling to concede that menstruation, according to the old theory of Sigismund (1871), is due to failure of conception. He suggests that the menses may represent "pseudopregnancy degeneration" as well as proestrus destruction "telescoped into one another."

Wallert<sup>22</sup> believes that it functions mainly during pregnancy. No convincing proof of its function or importance has been offered.

(h) *A quantitative conception of sex* has been well established by experimental demonstration and clinical observation.

In spite of inherent differences of sex bound to the chromosome (see Goldschmidt<sup>23</sup>) maleness or femaleness can be influenced by controllable factors, so that all grades between the complete female, through the intersexual types, to the complete male, have been produced in the lower forms.

Occasionally a true hermaphrodite is observed in the human species (Lacasagne<sup>24</sup>). Such an individual possesses a bisexual gonad (ovo-testis).

The bisexual anlage of the fetus (male wolffian, female müllerian ducts) respond quantitatively to the hormone developed by their respective gonad, but are unresponsive to the influence of the sex gland of the opposite gender. This is proved by the transplantation experiments of Athias, Steinach, Riddle (see Goldschmidt<sup>23</sup> p. 99).

At times, disease of the glands of internal secretion (especially of adrenal, and epiphysis) produce accentuation of secondary sex characters of the opposite sex such as hirsutes in the female. Whether this change can occur after castration is not determined. Castration produces a neuter condition, which according to the species may approach more to the male or female type.

#### PATHOLOGIC VARIATIONS

Pathologic variations, though difficult to interpret, have thrown some additional light upon the influence of the ovary.

The ovarian secretion may be completely lacking, may be decreased or increased.

Complete congenital absence of the ovaries is seen only in nonviable fetuses.

Lesser deficiencies produce "fetalism" and "infantilism," but these complexes are not clear because of the participation of the entire organism in these diseases which develop before puberty.

*Hypofunctional conditions*, in addition to the congenital ones just referred to, may be primary or secondary. They manifest themselves by anatomic hypoplasia of the genitals and poor development or regression of the female secondary sex characters, by amenorrhea, sterility, and dysmenorrhea.

*Hyperfunctional conditions*, may result from an increased output of follicular or corpus luteum secretion. Clinically we distinguish such complexes as "premature sex development," functional "menorrhagia and metrorrhagia," the "metritic" uterus, the "oversexed" female (if not due to a psychic factor), "functional hemorrhages," etc.

*Premature sex development* occurs with ovarian tumors in children (Harris, Crowell<sup>25</sup>) with epiphyseal teratomata (Lenz<sup>26</sup>) and with follicle ripening during childhood without other observable abnormality of internal secretion.

*Increased follicle secretion* after puberty, results usually from unknown stimulation, may, but need not, result from the "microcystic" or "polycystic" ovary (for some polycystic ovaries are inactive). The increased and persistent follicle secretion produces the pulsating, "throbby pelvis," the "metritic" uterus, the



violaceous vulva and usually causes menorrhagia or metrorrhagia or both. Scrapings of the endometrium show "stationary hyperplasia."

Robinson<sup>10</sup> has observed protracted estrus in ferrets in which the follicles persisted unduly.

Confusion has arisen from the fact that prolonged bleeding has been found to take place both with and without the presence of a corpus luteum. A persistently functioning corpus luteum (this often does not correspond to an inert, anatomically persistent yellow body) should maintain the nutrition of the "functional layers" of the endometrium and thus stave off menstruation. The marked hyperplasia, with superadded pelvic hyperemia, arising from oversecretion of follicle fluid can account for irregular and protracted uterine bleeding without a corpus luteum in the ovary (see Schickele and Keller, Schroeder,<sup>27</sup> Geist<sup>28</sup>).

Lack of space forbids an attempt at analysis of the effects exerted by the gonad on *metabolism*.

See Murlin and Bailey<sup>29</sup> for literature on basal metabolism, McCrudden<sup>30</sup> on metabolism of salts, etc. Doncaster<sup>31</sup> has advanced the theory that metabolism controls sex, not sex metabolism.

#### CHEMISTRY OF THE SEX HORMONES

Until the lipid extracts were studied, much of the literature was speculative and uncertain.

The earlier investigators contended themselves with using desiccated tissues, press juices or sodium chloride extracts without attempting chemical researches.

The lipochromes, inactive bodies, have been studied (Aschoff, Wallert<sup>32</sup>).

Microchemical studies of the corpus luteum lipoids have been reported by Cicaccio, Miller and others.<sup>33</sup> They have thrown no light on the subject.

Iscovesco<sup>13</sup> separated the lipoids into various fractions, some proving active, others inactive, but made few analytical studies.

Herrmann<sup>13</sup> claims to have isolated the ovarian hormone by fractionating corpus luteum substance with lipid solvents and then employing fractional distillation. The resulting oily substance contained 81.33 to 81.62 carbon and 11.32 to 11.49 hydrogen. No formula was produced. The substance appears to be a mixture.

Fränkel and Fonda<sup>34</sup> have gone further, using Herrmann's method, and claim that the empirical formula of both the placental and corpus luteum hormone is  $C_{32}H_{52}O_2$ . They have manufactured derivatives. Their work, though far more searching than that of Herrmann's is not conclusive. They believe that the substance is related to cholesterol, bile acids and bufotalin.

Zondek<sup>35</sup> recently reported a growth producing effect of histamin on the uterus. If this observation is confirmed, it is of great importance. Much literature will be found in Marshall.<sup>1</sup>

#### THE ACTION OF OVARIAN EXTRACTS

No two investigators appear to have used exactly the same tests to determine the potency of their preparations. The most popular method has been to employ immature or castrated rabbits and to note whether the organotherapy induced premature sex development in the former or hyperplasia of the uterus, vagina and breasts in castrates.

Lipoids obtained from the corpus luteum and placenta were produced by Iscovesco in 1912,<sup>13</sup> Aschner,<sup>36</sup> Fellner, 1913;<sup>13</sup> Seitz, Wintz and Fingerhut, 1914<sup>31</sup>; Herrmann, Frank and Rosenbloom, 1915<sup>13</sup>; Fränkel and Fonda, 1923<sup>34</sup>; Zondek, 1924.<sup>35</sup>

A lipid was obtained from the follicle fluid by Allen and Doisy, 1924.<sup>8</sup>

None of the preparations, notwithstanding the claims of Herrmann, or of Fränkel and Fonda, appear to contain the active principle in a pure form. All the active preparations, *whether of follicular, corpus luteum or placental derivation*, produced marked hyperplasia of the mucosa and musculature of the uterus, and glandular hyperplasia of the mammary gland, both in immature and castrated animals.

The objection repeatedly has been made that, because a given extract produces growth of the sex organs, this does not prove that this "hormone" represents the *full activity* of the ovary as a gland of internal secretion. The truth of this objection is obvious. It is quite possible that other, as yet unrecognized *part actions* of the ovary do not follow the lipid fraction—I was never able to reproduce Loeb's deciduomata, or to reproduce the "pregnancy" change in the hypophysis, for example, nor have careful investigations on the metabolism of castrates fed with extracts been made—but, as yet, we have no evidence that improvement in the technic of exhibiting active lipid products may not enable us to produce these accessory functions as well as the uterine and mammary hyperplasia.

The effects obtained by some clinicians, upon "flushes" and other vasomotor symptoms of the menopause, upon the uterine hemorrhages, the vomiting of pregnancy, on amenorrhea, sterility and other symptoms, can be accepted as empiric evidence by those so inclined. On the other side, equally creditable gynecologists and obstetricians report negative results. From a scientific point of view, such evidence must be thrown out of court by every investigator who is a physiologist or pharmacologist.

Such chemical and physiologic reactions as are at our disposal, appear to prove that follicle, corpus luteum and placental extracts are identical.

It is well to keep in mind that guinea pigs mature early and ovulate regularly, so that unless castrated, they are uncertain and deceptive as test animals.

Allen and Doisy<sup>8</sup> employ vaginal smears obtained from rats and mice by the method first recommended by Stockard and Papanicolaou,<sup>37</sup> Long and Evans.<sup>38</sup> This appears to be a useful method.

The sex *behavior* of animals (acceptance of coitus, actions upon approach of the male and psychical change) are unreliable, as I pointed out in 1911.<sup>2</sup>

Many other tests have been employed. I might instance the following:

The effect obtained on blood coagulation time, blood viscosity (Wintz,<sup>39</sup>) toxicity of intravenous injection (Villemain,<sup>40</sup>) etc. These tests must be regarded as nonspecific and in no sense an index of the hormonal activity of the ovary.

The aqueous extracts of Wintz have shown no activity when tested by me (agomensin). This applies as well to his lipid soluble extracts (sistomensin). Abderhalden has prepared ovarian "optones" by tryptic digestion of the gland substance. Such preparations are also physiologically inert.

Using the rabbit's uterus as a test object, I have examined the following ovarian preparations obtainable on the market. Positive results would be signified by visible hyperplasia such as my fresh lipoids produce in a dosage of 25 mg. for four doses. The dosage employed

was from six to ten times that dose, and was given for from six to ten times by injection, or orally, depending on the preparation.

Armour's ovarian substance	neg.
Hynson, Westcott's Lutein tablets	neg.
Burroughs, Welcome "Varium"	neg.
Parke, Davis } ampoules corpus luteum	neg.
} ovarian substance	neg.
Lederle's Corpus Luteum sol.	neg.
Sistomensin "Ciba"	neg.
Agomensin "Ciba"	neg.
Iscovesco's Gynoerinol } Hypo,	neg.
} Mouth tablets	neg.

Geist and Harris<sup>41</sup> have obtained similar results with some of the marketed preparations.

This shows that even those products, which from their method of preparation we would expect to be potent (such as Iscovesco's and Wintz's lipoids), under market conditions lose any potency they might have possessed.

The other products, (i.e., not concentrated) *ab initio* contain so little active substance that even the most optimistic should not expect any potency to be developed, no matter whether defatted, glycerinated or desiccated substance is used. Let me illustrate by the following:

I found it necessary to use 2 kilograms of hog's ovaries to obtain 207 c.c. of follicle fluid. The amount of ether soluble substance was too small to weigh and sufficed only to inject into one rabbit.

Two kilograms of hog's ovaries produced 358 gm. of wet corpus luteum. This supplied 2.7 gm. of very crude lipid extract.

From 5 kilograms of placenta 1.3 to 2 gm. of crude lipid may be obtained.<sup>7</sup>

The usual tablet or ampule now available for therapeutic use contains from 3 to 6 grains of desiccated substance, or the *watery extract* (physiologically impotent) obtained from 5 to 10 grains of ovary or corpus luteum!

I have been reproached with confining my attention to the uterine growth-producing effects of these extracts. I do this because a clear cut pharmacologic reaction results. I refuse as previously mentioned to gauge the effect by the amelioration of such notoriously uncertain symptoms as flushes at the natural or artificial menopause, production of or relief of amenorrhea, and cessation of functional hemorrhages and of vomiting of pregnancy. I marvel at the wonderful clinical results obtained by Graves, J. C. Hirst, Leighton and others but confess that I cannot duplicate them.

Why does it require 50 mg. of corpus luteum lipid extract per kilo of rabbit to produce genital changes, corresponding to the lipid content of 37 gm. of fresh ovaries, when it requires only 3 to 6 daily doses of 5 grains (0.3 gm.) of desiccated corpus luteum to markedly influence the genital sphere of a 50 kg. woman? According to the rabbit dosage it should require approximately 2 kilos of fresh ovary to supply the necessary amount per day! Is the human organism so

hypersensitive to the drug? It will require much more striking proof to convince me of such a physiologic anomaly.

#### SUMMARY

1. The primary development of the female genital organs, which include the mammary gland, depends upon the *action of the hormone elaborated by the growing follicle*.

2. The corpus luteum hormone produces a periodic accentuation of this effect and prolongs the growth stimulus during the early part of pregnancy.

3. The placenta produces further development of the genital organs in pregnancy.

4. (a) The follicle hormone causes the "premenstrual" or "pregravid" uterine change. (b) If no pregnancy develops, as soon as the corpus luteum becomes functionless, the hypertrophic uterine mucosa, analogous to rapidly growing embryonal tissue when the nutrition becomes impaired, breaks down, is exfoliated and bleeding (menstruation) then results.

5. The periodicity of menstruation is due to the fact that after the follicle has ripened—causing the "pregravid" change—ovulation takes place, and the corpus luteum inhibits other follicles from developing until the yellow body grows inactive.

6. Ovulation in the human female has been observed as early as one day and as late as 18 days after the cessation of the menses.

7. No function appears connected with the female "interstitial gland."

8. Sex is a quantitative phenomenon depending upon the character of the gonad and the amount of its hormone output. The male and female tubular systems (wolffian and müllerian) respectively react qualitatively and quantitatively to the male or female hormone.

9. The secondary sex characters may react to other glands of internal secretion in addition to the gonads.

10. Deficiencies in follicle secretion, possibly also in other endocrine glands during the formative periods, produce "fetalism" and "infantilism." When this deficiency first develops after puberty, hypofunction of the genital system results.

11. Excess follicle secretion produces "premature sex development" in infancy and hyperfunction of the genital sphere after puberty has been established.

12. Lipoid extracts of the follicle, corpus luteum and placenta produce marked hyperplasia of the uterus, vagina and breasts in experimental animals (rat, rabbit, guinea pig, cat, etc.).

13. The same dosage per kilo that produces a reaction in animals would necessitate the use of the extract of 2 kg. of ovary per day in the average woman!

14. Therefore it is not surprising that our present methods of ovotherapy are ineffective and the results obtained are as yet unconvincing.

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## CONTRACEPTION: A MEDICAL REVIEW OF THE SITUATION\*

FIRST REPORT OF THE COMMITTEE ON MATERNAL HEALTH OF NEW YORK

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THE medical profession has scant knowledge on which to base advice on control of conception. The gist of what is known is here given, together with an account of the attempts to secure clinical data.

As the objects of the committee were stated in this Journal last March (vol. vii, p. 339), it need only be said here that its scientific investigation of contraception—a section of its study of sterility and fertility—is under the complete medical control of a considerable group of representative physicians; that sponsoring the study was voted for in a questionnaire by the New York Obstetrical Society, and that an endorsement was given by the Public Health Committee of the Academy of Medicine.† This work is deemed to be a complete review of the medical literature; personal inspections of birth control clinics and their records; critical collection of foreign experience and American practice; an agreement on general medical indications; consideration of technic; standards for acceptable case histories and the collection and analysis of these; chemical and animal experimentation, and the setting of (and remuneration for) necessary research problems, laboratory and clinical, bearing on fertility and sterility,—all clinical work, when undertaken here, to be within the interpretation of our law<sup>30</sup> that sanctions contraception only “to cure or prevent disease.”

Deeming its most important duty to be the organization of a series of impartial, well-studied clinical tests, and believing that these should be made in responsible institutions, the committee made appropriations of \$300 each to six out-patient departments in order to add to its collection of adequate case records. It is also searching for hospital cases since an inspection was made of the cards in one doctor's office covering more than a thousand patients for whom she had placed the “wishbone stem,” and the finding, in several institutions, histories of serious damage done by this implement. Moreover the committee is trying to overcome the difficulty involved in securing and providing the supplies required in order to study certain claims.

*Need of Investigation by the Medical Profession.*—The data concerning contraception which can be brought together at this time are only

\*Read at the Forty-ninth Annual Meeting of the American Gynecological Society, May 15, 1924.

†The American Gynecological Society, at the meeting at which this paper was presented, voted to appoint a committee to cooperate.

sufficient to indicate on what lines research and clinical tests and records of effects should be undertaken. There is general recognition of the necessity of an inquiry—one that will be exempt from inelination to prove or disprove any particular theory. The subject should be capable of handling as clean science, with dignity, decency and directness, but with due consideration of the danger that certain forms of publication may pander to pruriency and give safety to license.

The medical profession alone can determine many physical questions bearing on structure, function and abnormal or diseased states. In addition to this mechanical side, the various mental and moral

### *Contraception—American practice*

*as inferred from the recommendations of 64 New York & Chicago specialists on obstetrics and gynecology (21<sup>st</sup>), white bar: and from reports from 730 married women, mostly college graduates, dotted bar, Davis, 9a: the two tables combined. More than one method usually recommended or practiced.*

#### ORDER OF POPULARITY



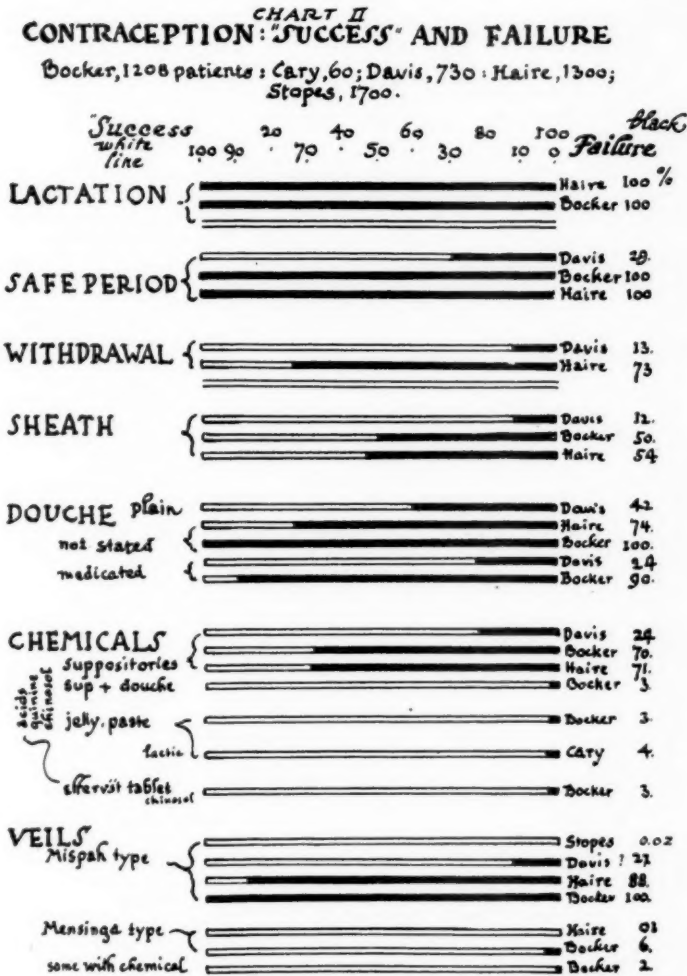
Chart I.

reactions that come chiefly to the knowledge of the doctor, as the father-confessor in matters of sex, should be taken from available records for consideration.

*Correlated Studies.*—One can attempt, in clinical tests, to set apart the purely medical from the economic considerations involved. This is our present thesis. But this segregation is feasible in part only. The contraception problem forms but one section of a study that must be conducted by a well-balanced group with wide interests,—a group that would take up the interlocking and overlapping problems of fertility and sterility and normal sex life, with the weighty bearing these matters have on individual character, and on family and com-

munity life. The work of the various organizations that are in touch with these questions will need to be coordinated.

*Order of Popularity.*—A chart has been made from the available figures from Dr. K. B. Davis' 730 educated American women,<sup>2a</sup> from Dr. Bocker's 1208 clinic patients,<sup>3</sup> and from the recommendations of



64 obstetricians and gynecologists of New York and Chicago<sup>21, 21a</sup> (Chart I). This may be summarized as follows:

With laity, douche and sheath rank as of equal importance, but withdrawal is close to them. Compared with these three nothing else has any standing. The clinic patients have tried lactation as a preventive next in order of frequency, and in a few cases veils, tampons and sponges.

With the doctors the sheath is the outstanding measure; the douche

TABLE 1  
METHODS OF CONTRACEPTION

METHODS OF CONTRACEPTION	FAILURES		ADVANTAGES	DISADVANTAGES
	COL- LEGE WOMEN	CLINIC WOMEN		
1 <i>Abstinence</i>	00	00	For the frigid and ascetic?	Nerve strain Infidelity "25 per cent"
2 <i>Lactation</i>		100 per cent		
3 <i>Safe Period:</i> (War, Germany, safety after 21st day)	29	100	Safe for a few women	
4 <i>Withdrawal</i> , coitus interruptus (France); coitus reservatus (Oneida Community)	13	70	Simplicity No apparatus No cleanup	Usually failure of wife's climax
5 <i>Sheath:</i> 2 kinds, rubber, skin, a. tested, lubricated b. douche for break or slip c. combined with chemical	12 fewer "	50	Relative simplicity. Only safety in venereal disease.	Blunting of sensation. Frequent refusal by male.
6 <i>Douche</i> a. plain b. with pressure c. medicated	42 24	100 90	Cleanliness	Not adapted to poor. Mouth of womb not cleared of semen.
7 <i>Chemicals:</i> (acids, quinine, chinisol) a. suppositories b. jellies (paste) c. effervescent tablet d. with douche afterward	24 4 4	70 3 3	Simplicity No handicap on sensation	Messy. Best results require douche  Not adapted to poor, if douche is to follow
8 <i>Veils:</i> soft rubber vaginal cups a. Mizpah type (snug on cervix) b. Mensinga type (distends upper vagina) c. with chemical d. douche afterward or next morning 8 a <i>Tampons, sponges</i> (medicated)	24	1 to 94 4 2 2 to 6 82	Place safety in wife's own care. No handicap on sensation	Requires careful fitting. Daily removal. Ulceration if neglected.
9 <i>Uterine Stems:</i> a. cervix only b. into body of uterus	some "	some "	Stationary safe-guard	Infection not infrequent. Probably abortifacient
10 <i>Sterilization</i> a. cautery-sound strictures at cornua b. tubal excision c. x-ray, radium	some	some	Permanent: Office procedure Insufflation proof of a and b	Few cases tried. Skill required Major operation, done on poor operative risk.

Nos. 4 and 5 place safety measures with the male.  
Nos. 6 to 9 place safety measures with the female.  
Percentages are drawn from the literature; about 4700 cases.

is ordered half as frequently as the sheath; the suppository is prescribed one-third as often as the sheath and usually supplemented by a douche; veils are recommended by only 6 per cent; withdrawal is condemned by all but four per cent.

On the other hand, the birth control clinics of London<sup>29, 15</sup> and New York<sup>3</sup> are depending largely on the veil; the New York clinic is testing chemicals alone, and the veil plus a chemical; no douche supplements either veil or chemical in these clinics.

The veil, particularly the large form, the Mensinga, seems to have never been given any general test by the medical profession in America.

*Order of Safety.*—Here we encounter a clash of evidence and opinion (Table I). Combining the specialists on diseases of women and obstetrics and the intelligent American couples, the sheath is the outstanding reliance. With it these couples report failures in 12 per cent; withdrawal shows a little poorer result than the sheath; medicated douches and suppositories and veils exhibit failures among one-quarter of the women reporting, and their plain douche troubles run to 42 per cent.

*Conflict in Evidence.*—Contrast the above with the record among clinic patients in New York and London in Table I. Taking both cities, this clientele reports failures of the sheath in 50 per cent. Such a discrepancy calls for consideration, for the New York figures cover no less than 507 couples. The difference of experience in safety is no greater than the difference in measures recommended. The three clinics employ chiefly some form of veil, or soft rubber vaginal cups, two of these using shapes that distend the passage high up, while all agree in claiming for them, in series totaling over 4000, less than 5 per cent of failures. In the New York report a chinosol-acid paste or a chinosol effervescent tablet without douche makes nearly as good a showing as the veils, and the combination of veil and chemical claims the best results of all. Douches, alone, though extensively tried among clinic patients, have resulted in failures up to 100 per cent in one series. Vaginal tampons and sponges as protectives have lost credit, and lactation ranks very low.

*New Teaching for America.*—The clinics, therefore, though they lack counsel from any group which is representative of the medical profession, and though their reports are open to question on several matters, such as bias, reasonably adequate records and follow-up, are developing the general principles of putting the care of the woman into the woman's own care, of fitting a vaginal device to be replaced and removed by her as needed, and of combination of safeguards.

*Nothing Less Than Certainty Needed.*—Wherever contraception is necessary in order to eliminate serious danger to life or health, no protection protects that ranks lower than one hundred per cent—else fear is not banished, and the penalty of failure is operative



abortion. Therefore the choice lies between total abstinence, or a simple procedure of sterilization (to be employed where there is permanent disability) or a guaranteed technic of contraception not yet worked out.

*Penalty of Faults in Technic.*—Published studies lack evidence of entry in their records of details essential to success in any technic, yet there is no method in which lack of attention to detail is not likely to result in pregnancy. For example, a means as simple, mechanically, as the sheath, appears to prove, in one private series studied, that the failures are due to lack of lubrication or absence of a douche available when needed, to say nothing of ignorance of the added safeguard of medicated lubricant or preliminary jelly or effervescent tablet.

*Adaptation to Individual Needs.*—Consideration of the conditions presented by each couple is called for, also medical opinion. As examples, let us note that the sheath and the douche appear to work poorly in the tenement; and that a measure like the veil, if indicated, requires that a doctor first select and fit the device, because of the variations that exist between different individuals in shape and size and position of various internal structures. Indeed, all measures show poorer results in the less intelligent.

*Success and Failure.*—By "failure" is meant a known pregnancy notwithstanding the uninterrupted use of a particular contraceptive. But it does not follow that the remainder are successes. Dr. Haire and Dr. Boeker both inform us that a patient who does not report is classed as a success. A fifth of the New York patients disappear; only half, in one London clinic, send reports. On the other hand, Dr. Davis' series show the specific successes. We shall hope to publish series properly classified, grouping those for whom a particular method yielded protection over a given number of years while each deliberate omission resulted in pregnancy, and those wherein protection was afforded for years, and then pregnancy occurred with or without known explanation. Similarly no case should be admitted to the ultimate list of complete successes unless there is adequate evidence that the couple was fertile, and fertile at the period the method was used.

*Abstinence.*—A special study of the effects will be made.

*Safe Period.*—This measure, now apparently sanctioned by the Roman Catholic<sup>4</sup> and Anglican<sup>5</sup> churches, consists usually in the restriction of intercourse to a period of four to ten days somewhere midway between the periods. Siegel of Freiburg<sup>28</sup> studied 320 couples early in the war at a time when German soldiers were only at home two to eight days. The fertilization curve reached its highest point (52 per cent) on the sixth day after the beginning of the period (2 days before the probable rupture of the follicle), remained at nearly

the same height until the twelfth or thirteenth day, then sloped down evenly to the twenty-first, while from the twenty-second to the twenty-eighth day no conception occurred,—the latter in what we infer to be some 11 per cent of the patients.

*Sheath.*—The sheath maintains its conspicuous place as the best known and simplest measure. It is believed to be trustworthy under four stipulations. These are good quality; testing; lubrication; and a medicated douche (such as one-fourth vinegar) available in case of slip or break. It is very commonly refused by the feebly virile and the selfish. For the careless and the poor it may be of little reliance, but as a preventive of venereal disease it has no competitor. The wholesale cost is from one and a half cents apiece for the rubber to eleven cents for the eecal.

*Withdrawal.*—This procedure claims a definite field among the vigorous whose dependable trained control is such that the wife may reach her climax first. The Oneida Community offers no inconsiderable mass of clinical evidence concerning absence of injury with absence of emission.

While the evidence concerning each measure will be taken up in detail in further communications, consideration is given in this article to measures less known in America, or which are the subjects of active discussion at the present time. The largest gap in the clinical reports is on the matter of injury or harm—local, or general, or to nervous system or morals as the result of the use of any or all of these measures.

*Chemicals as Contraceptives.*—Stopes<sup>20</sup> draws attention to the restricted number of chemicals tried, to the matter being largely in commercial hands and to its exploitation in the absence of any scientific study. Haire<sup>15</sup> writes that analyses have shown some commercial preparations to contain none of the drug claimed. Quinine and acid, in gelatine or cocoa butter suppositories, extensively used in England, are now a good deal discredited, because of irregularity in time of softening and consequent uncertainty. The pastes and jellies are to the fore. The preparation is deposited high in the vagina, just before entry.

The longest series of cases is from the Sanger Clinic. Dr. Bocker<sup>3</sup> reports 200 cases running 2 to 12 months, using a paste or a jelly of chinosol and acid, with 3 per cent failure; and 200 with a chinosol-acid-effervescent tablet, 2 to 5 months, with the same results.\*

*Lactic Acid.*—Because a high degree of vaginal acidity may cause sterility, Cary<sup>6</sup> suggested the normal constituent of the vaginal secretion as a contraceptive and advocated 2 per cent as being six times

\*She informs us (Aug. 1, 1924) that these measures were not supplemented by a douche and that, used in carefully selected cases, she has now had a total of 837 cases covering 1 to 18 months,—in chinosol pastes, 2 per cent failure,—in tablets 3.2 per cent failure. She deemed combination of tablet or paste with the Mensinga type of womb veil the best method.

stronger than his series of semen tests showed was necessary. He had a proper vehicle worked out, and this is an important item of comfort. A collapsible tube is used with a nozzle and this is capped by a dropping tube bulb (Fig. 9). He orders a douche immediately after emission. An occasional patient complains of burning. His failures in 60 cases have been two.

Animal experimentation by Dr. Isidor Kross,<sup>18</sup> done for the committee on a series of rats and rabbits, by vaginal injection of this lactic acid jelly, showed no effect upon the frequency with which conception occurred.

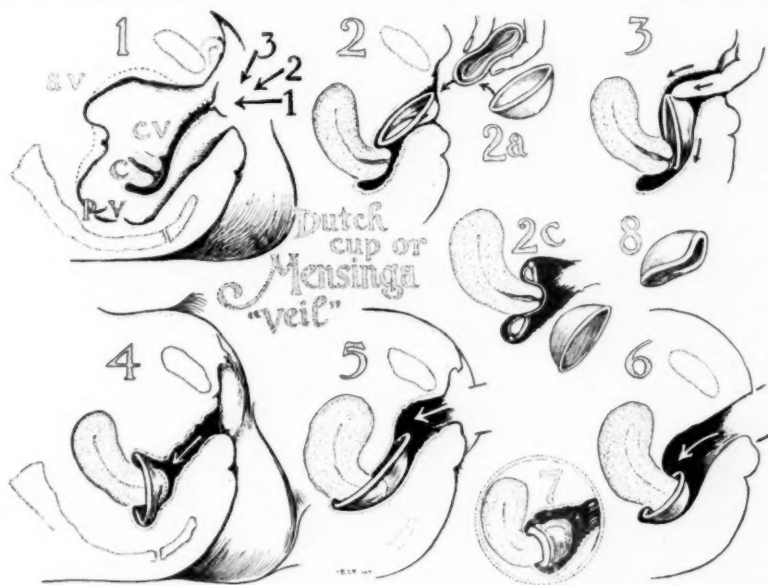
*Chinosol*.—The outstanding commercialized chemical is oxyquinolin sulphate, an antiseptic more powerful than phenol, but a feeble germicide. It does not coagulate albumin or injure mucous membrane. In some patients 1-2000 causes stinging. It is manufactured under a patent. It is a yellow crystalline powder of saffron-like odor, dissolving readily in water, the aqueous solution having an acid reaction. Ettie Rout,<sup>25</sup> working among the Australian soldiers on leave in Paris, sought for an agent deadly to gonococcus and spirochete, and used chinosol because a strength of 1:4000 kills the gonococcus in one minute. A 15 grain tablet, of slow effervescence, (0.2 chinosol) was developed that would stand tropic heat—that would neither be too friable nor too firm. These are the Proseldis Tablets of Harman Freese, Ltd., of London, costing three pence each there. She has only a hundred histories. Pre-kon-sol and Leucorrhol are said to contain chinosol. If Dr. Bocker's claims are verified no method compares with this for a combination of simplicity and effectiveness.

#### MENSINGA VAGINAL CUP PESSARY

*Contraindications*.—(1) The woman newly married with undilated hymen and vagina. After penetration becomes painless a pessary may be placed, but she will require a larger size when the vagina stretches. The 50 mm. is the smallest diameter ordinarily used. (2) Prolapse, an anterior vaginal wall sagging or with a cervix near the vulvar opening. (3) The inelastic narrow or tubular or very wide vagina. This leaves the cup with its long diameter in the long diameter of the vagina and fails to give protection along the anterior vaginal wall. (4) A cervix out of reach: Women with short fingers and a cervix placed far back in a deep pelvic cavity are physically incapacitated for fitting the cup over the cervix. (5) Some women cannot be trusted to withdraw the cup regularly and cleanse it. These may suffer from ulceration from long continued pressure, endotrachelitis from dammed up secretions, and vaginitis from foulness due to the clogging of the pores of the rubber with secretion.

*Procedure*.—The original advice was for the doctor to place the patient in the knee-chest position and thus to visually determine the

diameter of the upper part of the vagina and observe the fit of the ring in that widest part of the passage. Then the patient was turned on her back and the fit further studied. The dorsal posture, however, would seem sufficient for the estimate of the proper size. The spring (which does not make strong pressure) should distend with very moderate tension as shown in Fig. 4, and what is most important of all, should lie at a more or less strong angle to the axis of the vagina. Comparison between Figs. 4 and 5 will demonstrate right and wrong positions. Fig. 5 presents a circle which is too large and which therefore can only lie lengthwise of the passage. It would consequently permit entry along the anterior vaginal wall in the direction of the white arrow. On the other hand Fig. 6 shows a cup which



Figs. 1 to 8.—Vells or vaginal contraceptive pessaries. 1, The collapsed compared with the distended vagina. *c.v.*, Collapsed vagina, its front and rear walls in apposition; *c.*, cervix; *a.v.*, anterior vaginal wall in maximal distention in the parous woman; *p.v.*, posterior vaginal wall. Between *av* and *pv* the cervix projects. These outlines are averaged from measurements of seventeen patients in the knee-chest posture. While the tampon in the genupectoral decubitus exhibits this degree of distensibility in most women, this diagram would only be instructive for study of intravaginal rubber diaphragms and phallus action by recalling that in coitus the vaginal distention will be only  $1\frac{1}{4}$  inch in diameter. A deep reach will pass either anterior or posterior to the cervix as shown, to about this depth, the male length running very steadily at six to six and one quarter inches. Thus there will never be a vaginal cup needing any such wide span. The three arrows show the direction in this sequence, in which the cup should be passed in, or in which the phallus enters. 2, The spring in the edges of the Mensinga pressed together by the patient to pass the introitus, where it soon pockets in the anterior fornix and is blocked by the cervix. Then 3 shows the maneuver by which the tip is dislodged, through pressure along the anterior vaginal wall well up behind the symphysis. 4, A proper size, set across the vaginal axis and distending the upper vagina. 5, Too large a circle lies in the vaginal axis and exposes the cervix to attack along the anterior wall. 6, Too small a cup permits displacement and entry in front of it. 2a, Shows the "cup" position when a spermicide jelly is to be placed in the cup. 2c, Shows the original "dome" position of Mensinga. 7, The Mizpah type of vaginal cup pessary by which, instead of vaginal distention, a snug fit and suction on the cervix is sought. The ring is solid rubber, grooved for the snapping on of a cup of thin rubber. 8, The Matrisalus, like a reversed Smith pessary with a dome of thin rubber, to lift the anterior vaginal wall and thus prevent entry anteriorly. Useful with moderate cystocele.

does not distend the upper part of the vagina, and therefore also leaves an elastic pocket of the inner part of the anterior vaginal wall which the glans may enter and thus over-ride the ring in front. Mensinga and Haire recommend this cup placed as shown in Fig. 2c, but if it is desired to fill the hollow with some chemical paste or jelly in order that the external os may be smeared and protected by such action, it would seem better to keep the concavity downward, Fig. 2a.

Anteflexion of the cervix would seem favorable for the Mensinga, as the cervix points forward. On the other hand a cervix pointing far backward in a long vagina appears not adapted to this protection. Seant imagination is an unfavorable situation. To the poor any means is specially adapted that takes into consideration the inevitable lack of privacy. A device that calls for no evening douche and is removed the next morning qualifies for the conditions. Moreover the protection of the woman is placed in her own hands.

While the Mensinga type (Ramses, Lambutt, Dutch Cap) is supposed to depend upon a fit that distends the wide upper part of the vagina, the Mizpah type (Pro-Race, Stopes, check pessary) is planned to fit snugly over the cervix as shown in Fig. 7. In this diagram the

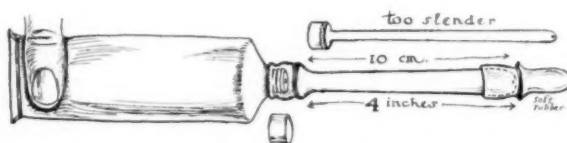


Fig. 9.—Jelly or paste in collapsible tube furnished with nozzle and cap (dropping tube bulb). The nozzle should not be so slender that the urethra could be entered. By keeping the nozzle on the tube, the jelly inside the nozzle does not have to be washed out after each application nor is such quantity wasted.

favorable conditions for such use are indicated in a long and somewhat conical cervix well within the reach of the introitus so that the patient can make sure that a vacuum or suction effect holds the soft rubber ring snugly on the cervix, both before and after coitus.

Where the anterior vaginal wall calls for deeper indentation or uplift to prevent passage of the phallus, the Matrisalus hooded pessary has been recommended (Fig. 8). It has a "turtle-back," an anterior up-curve, like a Smith pessary wrong end foremost. A reversed Hodge with a Mizpah cover is still more effective.

After the proper sized Mensinga has been placed, the patient withdraws or the doctor withdraws and the patient examines herself in order to feel how the cervix projects within the circle of the ring. She must be able to identify this little knob and its position. She then extracts the cup and replaces it herself. Finally the doctor verifies the position.

The patient is instructed to make very sure that she is able to place the ring correctly before she trusts it. She is given a prescription or a collapsible tube of lactic acid jelly or one of the chinosol prepara-



tions and told to use this both as a lubricant and as a filler of the cup to the extent of about a teaspoonful. She is instructed that full protection involves getting up after emission and taking a plain warm water douche, using one-half of the water before removing the womb-veil and one-half of it after its removal, taking care in the second part of the procedure to distend the passage under pressure by holding the external parts together and letting the water come out with a gush.

The veil can be put in place in the afternoon or when dressing for dinner or before retiring. In the Haire and Boeker clinics no douche is ordered and the removal takes place the following morning. The committee's observer, in an inspection in Holland, reports that this is the only measure advised by the women instructed by the New Malthusian League. Following the printed leaflet of Dr. Rutgers,<sup>27</sup> they order a douche next morning, part of the fluid to be injected before removing and part after removing the ring. These instructions also specify that before introduction of the pessary the bladder should be emptied.

Figs. 2 and 3 will show the steps by which the woman places the veil, and Fig. 1, 1, 2, 3, shows the directions in which the ring enters in their sequence. She compresses the sides into a figure of 8 shape but is warned that she might break the spring if she collapsed the ring too sharply. She is told that either side up would work and that as long as the mouth of the womb is encircled and projects through the ring and is felt covered with rubber that the ring is in proper position. Also that it cannot slip away, "further up," and "be lost." After it has been lubricated and has been placed within the passage she is told that her finger or thumb must push in along the front wall so as to drive the front part of the circle inwards and even, at first, upwards in order that the further part of the circle may jump across the projecting cone of the mouth of the womb, which is explained and likened to four fingers held together. This step is made quite clear to her as the only trick with which she will have difficulty. Occasionally she needs to be sent home to practice the placements and to return to demonstrate her proficiency. It is found that patients readily learn the method and that but two or three sentences of instruction suffice, fewer words than we have found necessary in explaining processes. The wholesale cost is fifty cents.

*Advantages.*—As a contraceptive measure the cup appears to present points not to be secured with any other method. Withdrawal, to be sure, interposes no covering at all and brings about complete contacts, but it does not permit of an emission within the vagina and often prevents the wife's climax. This covering of the cervix is said not to interfere with sensation for either partner.

*Objections.*—The literature contains many cases of damage produced by this instrument. This appears to have been because Men-

singa directed that it should be left in place all the time intervening between the periods. Under these conditions the soft rubber becomes very foul, and the secretions of the cervix are dammed up. Possibly the method has been condemned for what appears not to be inherent in the method. It would seem that daily or frequent removal, cleansing, drying, or boiling, would overcome this objection, and such is the evidence of the two clinics whose main reliance it is.

*Further Study.*—Because of the extensive use of this measure for forty years in Holland and on the Continent,\* and because of the recent commendations from two of the birth control clinics it has been thought important to secure tests in well accredited clinics.

#### INTRAUTERINE STEMS

Intrauterine stems are divided into two sections, the shorter varieties that stopper the external os and reach in no further than the canal of the cervix and the longer sort intended to spread in the body of the uterus, reaching upward from a button outside the external os.

*Cervix Stems.*—Cervix stems are relatively uniform in shape and size and resemble a mushroom upside down, or a collar-button. What chiefly holds them in position is the posterior vaginal wall. The first placement is usually by a doctor or midwife. Some patients take them out before a period and have them put back after the period. They are made of hard rubber or aluminum, sometimes of gold or silver. There are very few data to be found concerning these short stems, but it may be guessed that the damage done by them is slight compared with the possibilities of harm producible by stems that enter the body of the uterus. Menstrual fluid and cervical secretion can escape with these shorter devices in place. It would seem likely therefore that semen could enter if fluid can make exit.

*Stems that Enter the Body of the Uterus.*—The form generally employed is the so-called "wishbone" and is made up of two wires tapering from a Y shape at the top downward as a spiral in the cervix, ending in a metal disc or circle outside the external os. The diameter of the wire is less than one millimeter but the upper end is usually doubled or broadened. The introduction is made by placing the tips in half of a gelatine capsule. The ends spread after the capsule dissolves. The capsule is wet in 5 per cent carbolic acid in alcohol, else it is said to be a not infrequent carrier of infection.

There is a device made of strands of silkworm gut which form a one inch circle for the body of the uterus. These strands are then

\*Russia: The head of the Department of Maternity and Child Welfare of Moscow, Dr. Vera B. Lebedev, informed our representative that the Government did not believe in promoting birth control by propaganda, but that they had a commission to study out the best methods and that they had discarded chemicals and taken to mechanical means such as the pessary. They were strong for having everything under medical control, and information given by physicians. Dr. Lebedev's detailed communication has not yet arrived. The Russians are experimenting further with "inoculations of a sperm serum."

wound with silk to make a stem inside the cervix, with a glass button outside (Pust).

The body of the uterus is supposed to exhibit a cavity of a standard shape, namely, a triangle with its base up. This may be likened to a capital letter Y. But actually the cavity, as shown in the casts of the interior (from Guyon, Fig. 10) may have the form of a capital T or I. A wire intrauterine stem of a Y form, its points drawn together to introduce, and the spreading arms released and thrown apart by a spring, will tend to have these arms bury in the lateral walls of the body of the uterus whenever the interior is of the T or I shape.

The outward pressure of these slender wires has been found to act inside the cavity of the body very much as our silver wire or silk-worm gut does when it is used to sew the Baldwin glass stem in place

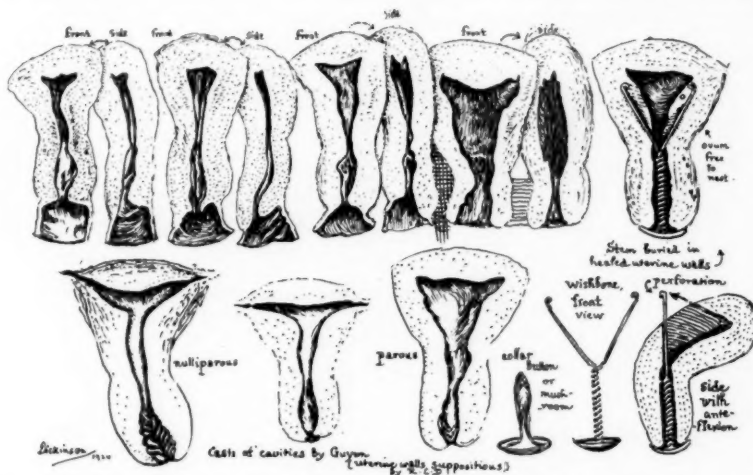


Fig. 10.—The uterine cavity, as shown by casts, and its relation to the intrauterine stem. Note the variety in shape and length and that the "wishbone" or Y-shaped stem, when a misfit, buries, and the ovum beds above it.

by transfixing the cervix high up. Owing to the normal regular uterine contractions these sutures sometimes slowly cut their way down through the cervix, the tissues healing behind them without evident inflammation. Thus the wishbone wires may bury and the lining heal over them. I have apparently found this with filiform and fine probe twice by following up bleeding lateral pockets after removal. After the lining has healed over the wire the ovum may then bed in the endometrium. Both these clinical findings, noted on cases sent in to me for study, were confirmed by the doctor of the largest experience with this form of stem, Dr. Mary Halton of New York, who showed me records of over a thousand cases. Her practice, she said, was to withdraw the "gold pin" at the end of two months, then to sternly forbid intercourse to let the cavity heal, and to reintroduce the instrument.

This "wishbone" has brought about so many abortions and infections that it merits the consideration here given. It has been accused of being protective by producing regular early abortion. We are gathering cases of some of the inflammatory end results and have four in hand, and nine to come, one fatal. I have found two in pregnant uteri; one stem was delivered with the baby, one within the placenta. Dr. Chard discovered one inside a fibroid.<sup>7</sup>

#### STERILIZATION

*Temporary Sterility—Injection of Semen Hypodermically.*—Dittler<sup>11</sup> and McCartney<sup>19</sup> have produced in fertile pairs of rats sterility varying from a few weeks to thirty, and have found the litters cut in half when conception began again. Haire<sup>15a</sup> has "experimented with poor success." This is subject for research.

Various observers have studied the effects of *irradiation*. Bailey<sup>2</sup> a year ago summarized the literature on this subject, and has drawn attention to the danger of the formation of monsters, disturbances in the development of the nervous system, and production of inherited defects in the young. He states that irradiation injures the follicular elements of the ovary. He presents six cases. Pemberton<sup>22</sup> brings together thirty-four pregnancies following radiation, and infers that "deformed or undeveloped children are not likely to follow such treatment," but that the chance of miscarriage is increased.

The reimplantation of an amputated tube or temporary burying of the ovary in the inguinal canal has not been studied out.

*Permanent Sterilization.*—The irrevocability of this choice must be borne in mind. The indefatigable Nürnberger (1917) details the 36 different forms of tubal operations, including tying the tube in a knot. He lists only 6.5 per cent of failures but admits this does not represent the actuality. Rubin's<sup>26</sup> inflation tests will soon tell us whether we succeed or not.<sup>10a</sup> Aldridge<sup>1</sup> has reported three reopenings after five tubal amputations, and Rubin has seen two patencies after sixteen tube sterilization operations.

Several of our members have taken stands on this matter, notably E. P. Davis<sup>8</sup> and Richard Norris, who look favorably on sterilization, while Chas. C. Norris rarely finds indication for the operation.

*The indications for sterilization versus contraception* need clear definition and discussion, and will be fully discussed in a later paper. If only decompensated hearts and pronounced tuberculous processes, for example, are now to be considered warrants for sterilization, it may not be forgotten that these patients are not good subjects for laparotomy.

This induced Dickinson<sup>10</sup> (Fig. 11) to study simpler methods than opening the abdomen. Somewhat extensive experience with the nasal cautery electrode in obliterating chronically infected urethral glands,

in destroying nabothian cysts, and shrinking hypertrophied granular cervix surfaces led him into the far corners of the uterine cavity to apply the hot wire loop there and stricture the bristle-sized opening by a circular contracting scar. The earlier cases were before the days of tubal inflation and therefore not proved. Since the gas or air test came in he has had only eight cases. In one lopsided uterus

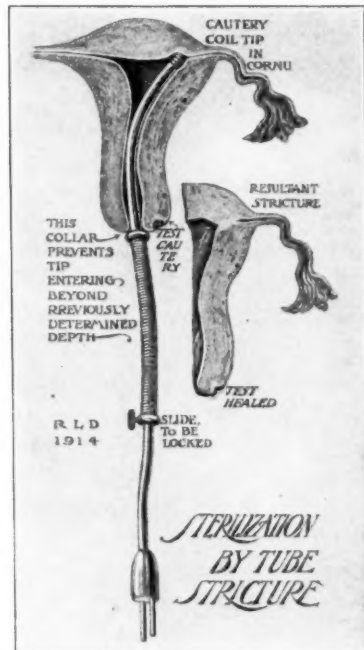


Fig. 11.

he can find but one angle. One other, with a 20 to 30 mm. exit pressure, fails to shut off. The others stand 200 mm. The method is submitted as rational.

#### BIRTH CONTROL CLINICS

Contraception has been busy reversing the law of survival of the fittest. For fifty years the educated, the thrifty, and the self-controlled have been increasing their precautions to limit their progeny, while toward lessening the indiscriminate breeding of the less fit and its world menace (by giving preventives to the poor) there have been only four systematic attempts.

*Holland.*—The “Nieuw-Malthusian Band,” under Dr. Rutgers, has for over forty years “trained” women of the lower middle class, for a fee of about six dollars, by a few lessons and a reasonable pamphlet of instruction.<sup>27</sup> They fit Mensinga-type pessaries which are to be left in one night at a time, followed next morning, when removing, by a douche given with a large glass syringe. The “Band’s” printed list<sup>27b</sup>



carries the names and addresses of three doctors, four midwives, and forty-three "practitioners." These are under no supervision by health authorities or the "Band" and decline to make reports to the parent organization. Instruction and pessary and syringe are given to any woman applying, for four to eight guilders (\$1.60-\$3.20), but there are several thousand small-fee members, mostly of the working class, who receive a rebate. The methods observed were none too clean. There is reason to believe that some of these "practitioners" induce abortions if their measures fail. The propaganda is largely on the basis of the economic indication. After delivery each Amsterdam mother receives a circular. The conservative and orthodox would appear to have been antagonized. The Protestant Queen, whose subjects are one-third Roman Catholic, is said by the opposition league<sup>23</sup> to only automatically endorse the "Band" as one among other national societies. The openminded Health Commissioner in Amsterdam stated that the government's attitude is officially neutral, but actually rather against it. There was no contraceptive instruction heard of in clinics or in medical schools.

Of the seventeen gynecologists and eight other doctors interviewed by our investigator, six favor the sheath and eight the vaginal cup, but none claimed for the latter above 75-90 per cent efficacy. Holland's experience therefore is very disappointing in the way of definite information, notwithstanding the propagandists' persistent exaltation of the Lowlands as a paradise of birth control, with "fifty-two clinics," located in "hospitals" and under the aegis of "medical associations."<sup>7a</sup> Concerning the vote on indications and detailed experiences we shall report later.

*London.*—The Mother's Clinic, 61 Marlboro Road, was opened March 17, 1920, and reports about 4700 patients up to our investigator's visit in June, 1924. Entirely supported by Marie Stopes, her husband, and the large returns from her books, it is located in a middle-class neighborhood among stores, occupying two tiny rooms in a frame building, but with a pleasant atmosphere. It is open five mornings, three afternoons and one evening a week. Two midwives are on duty, but a woman physician attends once a week, and pathological cases are referred to her. Admission is free, but unmarried women are not accepted and women who have had no child are referred to physicians. For supplies a price list and pharmacists' addresses are furnished. The history calls for scant data and the records seen were not complete. Each patient is given a blank to report results and about one-half do so. The Stopes Pro-Race cup (of French or simplified Mizpah type), has a thick rubber rim and goes on the principle of snug suction fit on the cervix, and not on the idea of distending the fornices. Though in her book Dr. Stopes uses any argument to discredit other forms or methods for ordinary conditions, it was noted in her clinic that a large

sponge with olive oil was ordered, plus a quinine suppository, plus a douche with an enema syringe, but this may have been in a patient with "sagging muscles." The sponge, with vinegar, plus the suppository was also commended for a torn cervix. If the cap does not fit, the sheath is the choice, also for any woman with long vagina and short fingers unable to place the device.

Marie Stopes, Ph.D., is an authority, forceful, eager, critical and discursive. Her book<sup>29</sup> covers the ground very completely but also with very complete bias. She stated to our observer that the records of the clinic had not been analyzed but affirmed that she knew of only twenty to thirty failures with the Pro-Race cup. (The Walworth clinic has observed nearly sixty from the Mothers' Clinic.<sup>15a</sup>) The attendant doctor likes the sponge-covered cup with quinine ointment. This clinic's "Research Council" with some fine medical names, has declined to foster any research,<sup>29a</sup> though our English interviews brought general commendation of the idea.

The Walworth Women's Welfare Center, 153-A East Street, Walworth, S. E. 17, supported by the New Generation League (formerly the Neo-Malthusian) begun six months later than the other clinic, is in a two-story, frame building in the slums. It is open three afternoons and one evening a week and shows friendly, crisp, intelligent methods, under an upper class social worker superintendent, with an efficient woman doctor, a nurse, and a maid. Everything is scrupulously clean. The charge is one shilling, if able to pay, nothing if not; five shillings if it can be afforded, the pessary at two shillings, sheaths at nine pence. Mail inquiries are answered by a pamphlet. The methods used are about 70 per cent Mensinga, relatively large size (No. 70) combined with a non-greasy quinine ointment, the cup removed next morning, with douche before and after removal. The Matrisalus is fitted where the pelvic floor is relaxed. The sheath is ordered for about 15 per cent. The return visits comprise nearly half the attendance, the total about 225 a month. The record blank cards are excellent. Abortion is refused.

Dr. Norman Haire, who developed this work but is no longer in it, is very intelligent and well posted, but apparently addicted to round numbers.<sup>15</sup> Havelock Ellis speaks well of him.<sup>12</sup> Haire said that he uses a boric-acid-lactic-acid-glycerine preparation for adjuvant to the Mensinga, which is placed dome side up. He stated that most doctors use too large a size, and that the cup is not suitable for torn perineums and retroversions, and that the Rout chinisol tablets often fail to effervesce.<sup>15a</sup>

There is said to be a new pay clinic, the Wallace Institute, an offshoot under two women doctors. The views of leading medical men and women will be published later (with names suppressed by

request). The work of Dr. Stopes has brought out many forceful and apt expressions of opinion.

*New York.*—The clinic run by Dr. Dorothy Boeker next the office of Mrs. Margaret Sanger's Birth Control League began Jan. 2, 1923, in a room fitted up for simple gynecologic work on the upper floor of a business building, at 104 Fifth Avenue, in a loft section. A lay secretary receives patients and excludes all but those married and requiring contraception for the cure or prevention of disease. Five visits on the part of six members of our committee have given an impression of a desire to live up to the law and to stand wide open to inspection. There is alert and vigorous action morning and afternoon, five days a week—and no lack of publicity. Dr. Boeker is particularly well informed on contraceptive matters, and her pamphlet<sup>3</sup> is a clear and explicit brief publication. Whatever its imperfections, this work is carried and reported with a research idea—which is novel in propaganda work. The history forms are full and well balanced but the entries often scant. Medical inspection or supervision or check-up must be trifling or absent. For follow-up, they depend on return of patients for the purchase of supplies. Twenty-one per cent fail to return or report.<sup>3a</sup> The important published results are the successes with a combination of the Mensinga type soft rubber cup (Ramses, Lambutt, Dutch, Haire) and a chemical, or with a chemical alone, chinosol and acid in paste or effervescent tablet. The chemical has been employed alone largely because the vaginal cup can be obtained with difficulty. This report of twelve months covers 1208 patients with experiments numbering 1558 (but the items total up 1458).

The Voluntary Parenthood League of 19 W. 44th Street, New York, started in 1919, does no case work but is concerned wholly with attempts to alter the Federal law.<sup>30</sup> This labels as obscene and forbids transmission by mail and express (or importation) of contraceptive information or devices. The League's collections are \$12,000 this year. The Director is Mrs. Mary Ware Dennett. Its publication is the Birth Control Herald.

Special birth control clinics, widely heralded, may be required at present to furnish legitimate advice not otherwise procurable, and also to gather clinical evidence. But they seem needlessly costly,—let us say, in America, at eight to nine dollars a patient—when our ample obstetrical and gynecological outpatient services might be able to tender this care at seventy-five cents per capita.

*The Committee's Experience with Clinics.*—In attempting to determine what was the size and character of the problem we opened an office, not for examination or treatment, but for reference and record, supposing that there would be considerable demand,—the diagnosis having been made—to send women to institutions of high standing

for advice. But it was found that an intermediary was little needed inasmuch as most institutions could recognize proper cases and furnish the advice, provided their Trustees and Staff were willing, their doctors knew what to direct, and supplies were available.

It has taken more than a year to get a few leading institutions willing to make the study, to search out what advice is advisable to give them, and to develop supplies. The committee has worked with one nurse to visit settlements and institutions to make inquiries and to follow up, and one stenographer; with a short time library worker; with a doctor who was traveling consenting to undertake our foreign study, while an unpaid medical secretary gave odd times to getting the stuff together and summarized. We have \$4000 toward the \$6000 for local work for the year ahead and are offered for researches in sterility and fertility and for planting clinic studies elsewhere in this country and abroad, a dollar for every dollar we collect for such extension, up to \$10,000 for the year, or a budget of \$26,000 in all.

#### THE NEED FOR A CLINICAL STUDY OF CONTRACEPTION AND STERILITY—

##### SUMMARY

1. Our search discovers no investigation of "birth control" made in a scientific and ethical spirit and approaching the subject without bias. Review of the literature discloses a library of argument that condenses to a pamphlet of case histories.

2. Wide divergence of opinion exists, largely owing to the meagerness of clinical evidence and to prepossession on the part of observers. For example, opinions gathered by questionnaire from 64 gynecologists vary greatly from the experiences published by the three birth control clinics of London and New York.

3. The committee's investigation carried on in Holland demonstrates that this much quoted paradise of birth control is without clinics or clinical reports or consensus of opinion. Our English interviews show divided counsels, with no checking up of the returns from the two clinics. German authorities urge us to conduct a thorough-going inquiry. Russia is reported as starting some investigation.

4. The medical profession is not yet cognizant of any guaranteed contraceptive. In the very large number of cases where contraception works securely, as well as harmlessly and happily, we shall expect to find a choice rightly adapted to the particular couple, often with two measures combined or in sequence, and above all with attention to detail. It is our business to discover and define such conditions.

5. Sterilization by removal of the uterus prevents future pregnancies. Removal of the ovaries produces a surgical change of life. Both entail definite hazard, particularly to those most needing protection, such as patients with active tuberculosis or rheumatic hearts. Operations on the tubes are under question since the new insufflation tests

show reopenings. This test is now essential after all such operations. The simple, "non-operative" cautery sealing of the tubes is on trial.

6. Irradiation of the ovary calls for further experiment on dosage, on possible damage to future progeny, and risks of abortion.

7. Among ordinary contraceptive devices, some that are found reasonably efficacious among the intelligent are said to fail in half the clinic patients. Yet it is among these that the need is greatest. In one outstanding report from 1000 educated American women, 730 believed in the rightness of regulating pregnancy and practiced it without unduly lessening the number of progeny; in a dispensary series 41 per cent of the women had some knowledge of preventive methods, the restriction (above 4.7 children) being in proportion to their knowledge.<sup>17</sup>

8. The one contraception experiment supposed to be carried out on a national scale (the French peasant's withdrawal) has not yet been subject to medical case study regarding its effect on health and reciprocity. The forty year community experiment with coitus reservatus at Oneida was medically studied and the method apparently exonerated.

9. Dependence on the plain douche and any douche alone is largely discredited.

10. Doctors and educated couples in America rely largely on the sheath. One large group shows failure in 12 per cent, whereas among the poor two clinics report 50 per cent failure in extensive series.

11. The use of the sheath calls for testing, lubrication, and ready access to a medicated douche in case of accident.

12. Among chemicals, suppositories make a lesser showing of protection than jellies and pastes and effervescent tablets with chinosol and acids, for which only 3 per cent failure is claimed, covering 837 cases in one clinic report.

13. Infection from stems within the cavity of the uterus is not infrequent.

14. The chief measure which puts the woman's care into her own hands, and is the main recommendation of students of birth control abroad and in this country is that form of soft rubber cervix cup distending the upper vagina which was originally devised by Mensinga, but is not sold here. This device, fitted by a doctor, used for the occasion, and in proper cases, (best combined with a medicated jelly) claims minimal failures and offers case histories. It should receive careful clinic tests—with patients who fall within the law—that is, where contraception is required temporarily or continuously "to prevent or cure disease."

15. In all methods details of technic are found to be of great importance.

16. Where permanent prevention of pregnancy is required, trial



should be made of the relatively simple method of sealing the tubes by the stricture that results from cautery burns of the minute intrauterine openings of the tubes.

17. The data should be collected under competent supervision, the physical questions by properly qualified members of the medical profession. The doctor is the person to select and instruct, because the need must be proved and the recommendations fit individual requirements and particular physical findings.

18. The Committee on Maternal Health, as part of a study of fertility and sterility, has carried on several steps of the investigation of contraception and has under way clinical, chemical and laboratory studies. These, in due time, with proper supervision and adequate professional collaboration and sufficient funds, should secure the facts.

19. The subject is susceptible of handling as clean science, with dignity, decency and directness.

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(For discussion see page 654.)

## ACQUIRED ATRESIA OF THE VAGINA AND CERVIX\*

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WE will consider acquired atresia of the vagina and cervix with the understanding that it may be partial or complete. My choice of a title may have been misleading, because atresia means a complete closure, but was due to the fact that we have gotten into the habit of designating atresias as partial or complete in our records.

This subject was chosen because only passing attention is paid to it in most textbooks, whereas we find that it is really of considerable importance in relation to health, marital relations, and sterility.

We will disregard congenital atresia. It is not common and is nearly always accompanied by other defects of development such as absent uterus, double uterus, etc. We will not consider atresias due to new growths and cancer for, although they are common, the major disease is not atresia. The same may be said of the increasing number of atresias following the effects of radium treatment.

Examination of the records of the Free Hospital for Women for the past ten years shows that sixty-seven patients have been admitted to the hospital for troublesome atresias, mostly partial, of the vagina or cervix or both. There are eight in my own private practice, making seventy-five altogether.

It is necessary to classify these cases in some way and then examine them. The anatomic conditions before and after the menopause differ, so we have first separated them into pre- and postmenopause atresias. The normal atrophy of the genitals at the menopause causes a decrease in the size of the genital canal and an increased liability to chronic infections. These two factors, not present in the child-bearing period, play an important rôle in the causation of atresia after the menopause.

We will first consider the etiology of the vaginal atresia occurring in the premenopause age. Inflammatory processes as a cause were found in twelve. Ten had not had children, four of whom were single, and two had borne children. The process consisted of a constriction of part or whole of the vaginal wall in most of these cases, the constriction being in about the middle third of the vagina as a rule. This was due to a dense scar formation, running around rather than along the wall. In two cases only was it complete and in those not constantly, that is, there was drainage at intervals of months. Veit<sup>2</sup> says that most of these constrictions occur in the middle third of the vagina because that is where the levator ani muscles exert the great-

\*Read by invitation before the Brooklyn Gynecological Society, May 2, 1924.

est pressure in holding up the vagina, and their action tends to press the sides of the tube together.

The actual etiology in these cases is difficult to determine. In the six married ones without children the trouble was discovered soon after marriage in all but one case. No previous history of vaginitis was elicited. The same is true of the four single women. In only one was a history of children's contagious diseases obtained. This is the type of case that is supposed to be due to vulvovaginitis in childhood and to the contagious diseases such as scarlet fever and diphtheria. They may also be caused by neglected gonorrheal infections after puberty. It is interesting to note that only two showed any evidence of a pelvic inflammation. One had been operated on a year before for salpingitis and the other eight years before. Another had a macula gonorrhoeica but gonococci were not demonstrated. A Wassermann test was not done as a routine on these cases but none gave any history suggesting syphilis. We believe it would be wise to ascertain this point definitely in future. The excised tissue showed chronic granulation and scar tissue, with tuberculosis in none.

In the two who had had children the character of the atresia resembled an inflammatory process rather than a constriction following trauma but no doubt childbirth injuries were a basic factor.

Taussig<sup>1</sup> feels that proof is lacking that vulvovaginitis in children causes these atresias. He believes that if this were a cause strictures of the vagina would be more common and would be found in children. He says that the formation of the hymen shows that there is a tendency for the obliteration of that part of the tract and that therefore it is more probable that these atresias are congenital. King<sup>3</sup> answers this by saying, "As to the frequency of these atresias we might also ask why strictures of the male urethra do not occur more commonly."

We feel that the inflammatory etiology is more probable because there seems to be a definite formation of scar tissue in nearly all of them. They occur as a rule above the region of the hymen where the tendency to obliteration would not be likely to play a part. They are not discovered till later in life because complete atresia is uncommon, the vagina being a large tube. It must be remembered also that the inflammatory process may not occur until after puberty. We occasionally see a case that consists of recently formed granulation tissue.

Another cause may be injudicious cauterization of the canal as in the case recently cited by Grad<sup>4</sup> where a complete atresia of the vagina occurred following the application of nitric acid. Caustic douches may play a part. Sulphonaphthol used in too strong a solution has caused severe burns which might lead to atresia.

It will be noted that no case of atresia of the hymen occurred in this series. Veit<sup>2</sup> established pretty clearly that those cases which

are congenital are accompanied by other deformities of the genital tract. The ones that occur in utero as a result of adhesions or inflammation are discovered soon after birth because a bulging is noted between the labia. Incision of the hymen releases mucus containing blood and desquamated epithelium. Those discovered at or after puberty are the result of an inflammatory process closing an already small opening in the hymen and are therefore acquired rather than congenital. These cases are not common.

One bizarre case was a woman of twenty-nine who had a ring of condylomata around the introitus of the vagina and around the urethral meatus. She had been happily married until six years before when she began to have dyspareunia and soon could not bear coitus. She was examined by a physician who told her there was nothing the matter. Her husband obtained a divorce from her on the ground that they could not have intercourse. When the writer saw her five years later, she had the condition described, causing an actual partial atresia at the introitus, intense burning at micturition and pain when sitting. The condylomata were of the soft pale type, looking a good deal like normal mucosa, but were very tender, and probably were so small at the previous examination that the physician took them for the remains of the hymen. The patient confessed to no social lapses and from her history it seemed probable that the husband first infected her with gonorrhea. Excision relieved her completely.

The chief complaint in atresias resulting from inflammatory strictures is dyspareunia. The other important one is leucorrhea which is frequently blood stained. There may also be discomfort and pain in the vagina and lower abdomen.

If the atresia becomes complete serious trouble may ensue of which the following case is an illustration:

The patient was forty years old, had been married and was delivered at a normal labor of one child twenty-one years before. She was feeble-minded and a good history could not be obtained. So far as we could ascertain her menstruation had ceased five years before entrance, and pain in the lower abdomen began, which has continued. Probably two years before she came in she began to have bladder symptoms consisting of pain, with incontinence when lying down, and retention while in the upright position. She had some leucorrhea which was not at all marked. She worked until five weeks before we saw her.

The local examination showed an apparently complete atresia of the vagina about half way up. Rectal examination revealed a mass filling the pelvis, globular, smooth, firm, and tender. On introducing a catheter into the bladder about two ounces of thick muco-pus came out, followed by cloudy urine. Irrigation for ten minutes did not clear the bladder enough to make cystoscopy possible.

At ether examination the atresia was found to extend up to the cervix into which a sound was passed for two inches with no outflow of pus. The mass could still be felt and no definite uterus could be outlined. It was thought wise therefore to open the abdomen. The report of the operation is as follows: Median suprapubic



incision through thin anemic tissues up to the umbilicus. A somewhat irregular mass rises above the symphysis and extends to both sides of the pelvis, seeming solidly attached to them. The mass fills the pelvis so that the hand cannot be introduced behind it. What appeared to be a round ligament was seen attached to the right anterior aspect. The mass was taken for a uterus enlarged and deformed, and firmly adherent to the lateral pelvic walls through its chronically inflamed parametria. Removal out of the question. On passing a catheter by urethra the mass was seen to diminish, therefore a further attempt was made to free the mass posteriorly and explore behind it. This caused alarming hemorrhage and was abandoned, as hemorrhage deep behind the mass would be inaccessible. The peritoneum was closed and an extraperitoneal incision made into the mass. This proved it to be a bladder with a wall one-half inch thick, nearly rigid so that it could not collapse, and containing muco-pus and urine. The uterus could not be felt behind this thickened wall. The conclusion was that the entire mass was a greatly thickened and deformed bladder, adherent posteriorly and laterally to the pelvic walls. The kidneys, examined at the beginning of the operation, felt normal. The pathologic examination of tissue removed from the bladder wall showed chronic inflammation with the formation of connective tissue.

We believe that the sequence of events here was as follows: An inflammatory atresia of the vagina occurred with accumulation of secretion behind it which became infected with an organism of weak virulence; the infection spread through the vesicovaginal septum to the bladder with a resulting infiltration of the whole bladder wall and pelvic cellular tissue, in the course of years. The atresia did not remain complete long enough at any one time to cause a dilatation of the uterus; it must have discharged through a sinus at intervals though we could get no history of such an occurrence.

The unusual symptom of retention while erect is explained by the thick muco-pus running to the bottom and blocking the internal meatus while the patient was upright. On the other hand when she was lying down the pus again fell to the bottom, uncovering the meatus, so urine ran out and ran continuously because the rigid wall did not allow the bladder to collapse and distend normally but simply to overflow like a watering trough.

The next common cause of atresias in the pre-menopause stage is the result of plastic operations on the vagina for lacerations. The constriction occurs at the introitus in these cases and is due to making the opening too small in the first place, or to the occurrence of sepsis in the wound with the formation of scar tissue and later contraction of this scar. Two reasons for using interrupted sutures in our plastic work at the Free Hospital for Women are that we get better approximation of the edges with less chance of sepsis and, if a hematoma forms or sepsis occurs, the blood or pus can seep out between the stitches with less damage and scar tissue resulting.

Eight cases in this series come under this heading. The main symptom is dyspareunia, and the treatment enlargement of the opening.

Seven cases seemed to be the direct result of childbirth injuries. In

four there were extensive scars which caused an actual partial atresia and were themselves tender. In three the cervix was adherent to the vaginal walls. One of these had the anterior lip of the cervix adherent to the posterior vaginal wall near the introitus. This was discovered on attempting coitus for the first time after childbirth. The patient was the wife of a physician and he operated on her to release the adhesion. He said that the cervix was so firmly attached so low down on the posterior vaginal wall that he felt sure that it had been inadvertently sutured there by the obstetrical attendant during the postpartum repair of the perineum. When operated on by the writer some years later for prolapse there was an elongation of the anterior lip of the cervix protruding from the vaginal introitus which seemed to confirm his theory, as he had simply released the cervix and had not cut off the elongated lip.

In two cases the partial atresia was at the introitus and was due to atrophy during the artificial menopause, following hysterectomy, the atresia occurring two and three years later. In a third case plasties had been done at the same time as a hysterectomy. Therefore atrophy during the artificial menopause may cause troublesome atresia but it is a relatively rare occurrence.

One case had a tight perineum when forty-one years old, having been married sixteen years without bearing children, for which no definite cause could be assigned.

The premenopause atresias of the vagina are therefore inflammatory, postoperative, and traumatic in origin. The inflammatory ones occur at the middle third, the postoperative at the introitus and the traumatic at both. The actual etiology of the inflammatory cases is difficult to determine but it seems probable that the original infection was gonorrhea in most, either a vulvovaginitis in childhood or a neglected infection later in life. It is an affliction of the poor largely which would seem to be a point against the contagious diseases as a common cause. Acquired atresia of the hymen is not common.

As I have said, conditions after the menopause are changed because the normal atrophy of the genitalia and the increased liability to chronic vaginal infections plays an important part in causing atresia. The increased liability to infection depends on two factors. One is that the reaction of the vaginal secretion changes from acid to alkaline, according to Graves,<sup>5</sup> and therefore the defense against infection is weakened. The other factor is that the epidermis of the vagina atrophies, becomes thinner, and offers less opposition to invasion by bacteria. The decreased size of the vagina and thin epithelium allow more chance of traumatic injury during coitus with a resulting point of entry for bacteria.

Therefore one of the common and most troublesome diseases of the vagina after the menopause is senile vaginitis. This is a chronic

inflammation of the lining epithelium, characterized by infection which lodges especially around the papillae of the epidermis. You will remember that these papillae carry the blood vessels which nourish the tissue and come up into the underlying connective tissue. The infection gets its foothold at these points, and the stratified epithelium comes off leaving tiny granulating areas which ooze, causing a bloody discharge. Grossly the surface of the vaginal wall appears shiny and smooth, because the rugae have atrophied and flattened out and is slightly to dark red, depending on the severity of the infection. It is dotted with darker red points which are the inflamed papillae. This is an ideal foundation for a more severe inflammation at some point with an atresia as a result.

Gonorrhea may easily cause a vaginitis under these favorable conditions, but it is probably rare at this age, and accounts for very few of these infections. It is a mixed infection of bacteria with a virulence of a low grade.

In this series we find twelve cases which appear to have occurred in this way. The atresias are as a rule higher up than they are in the premenopause inflammatory ones, just below and around the cervix. In four cases the atresia was complete, while in one the opening was only one-half a centimeter in diameter. In the other seven there were adhesions around the cervix between the cervix and vaginal walls, and constriction of the upper part of the vagina. An important point is that three of these cases showed adenocarcinoma of the fundus of the uterus. The chief symptom of the two diseases is bloody discharge, so the finding of a vaginitis or an atresia should not allow one to neglect doing a curettage for a complete examination.

The inflammatory atresias of the vagina occurring after the menopause are more often complete than those before because the vagina is of a smaller caliber and because coitus is less frequent. In our experience the lesion does not extend as deep into the tissues after the menopause. It is more of an adhesion between two surfaces, which can be separated with comparative ease.

Nine cases showed a tight, partially obstructing perineum. In all these cases plastic operations for lacerations had been done before the menopause. The chief cause of the atresia seemed to be the atrophy of the menopause on top of the repair operation. Four of these had an accompanying senile vaginitis. One of the contributing causes of this vaginitis is a perineum so tight that it prevents free drainage of the normal vaginal secretion so that the secretion collects, decomposes, irritates, and macerates the vaginal epithelium which favors infection. The chief complaint is a constant overflow of foul, bloody, irritating discharge, with burning and soreness in the vagina and lower abdomen. The other five had tight perineums which caused dyspareunia.

Two patients had not borne children and complained of dyspareunia after the menopause. Here the trouble was due to a tight perineum caused by the normal atrophy of the menopause. One unmarried woman of fifty-eight noticed that she had a tight perineum and it worried her and made her so nervous that it had to be operated on.

We found eighteen cases of partial or complete atresia of the cervix. Only five occurred before the menopause so it is evident that the atrophic contraction of the cervix occurring at the menopause plays almost the chief part in the etiology. Three of these five had had repairs of the cervix and complained of dysmenorrhea and leucorrhea. The atresia was only partial. The fourth one complained of menorrhagia with bleeding off and on between the catamenia. Examination showed a tight external os due to scar tissue, and dilatation revealed old blood in the uterine cavity, a damming up with an overflow at times. The fifth case had had no period since the instrumental delivery of her baby nine months before, although she had the menses each month. The uterus was the size of a two months' pregnancy. Examination showed an obstructing membrane at the external os. On dilating the canal old blood flowed out, the uterus decreasing in size. This revealed a mass in the pelvis which at operation, done some time later, proved to be chronic salpingitis and not a hematosalpinx.

One of the other thirteen cases had a rather interesting history. She had had her tubes and ovaries removed at thirty-one for tuberculosis. When seen by the writer, thirteen years later, she gave a history of headache of six months' duration, coming for two or three days and going away when a profuse discharge of pus occurred from the vagina at weekly intervals. The examination showed a pin point os which would not admit a fine probe. On forcing a passage and dilating the canal about an ounce of pus was obtained. The curettings showed tuberculosis and at the hysterectomy the general abdomen was found to be entirely negative, the uterus flabby with a dilated cavity.

Of the other twelve cases the outstanding points are that seven had a senile vaginitis, four had cervical polyps, and in three the atresia was complete enough to cause the collection of pus in two cases, and blood in the third in the uterine cavity.

We believe that the atresia in these cases keeps up an endocervicitis and some backing up in the uterine cavity which causes a discharge irritating to the vagina. A senile vaginitis results which will not stay well until the cervix is dilated and treated.

The commonest symptom is bloody discharge, from the associated vaginitis. Such cases are subjected to an ether examination as a routine, to rule out cancer, and the cervical atresia is then demonstrated. The cases with pyometra had sudden, short flows of pus

every two or three weeks and pain in the lower abdomen. The one with hematometra had constant slight bleeding for several months, which was an overflow from the blood backed up in the cavity, although she had had the menopause two years before, at fifty-two years of age. The curettings showed gland hypertrophy, and she was treated with radium. In the other cases the endometrium was usually atrophied. Cancer was found in none. It should be noted that the finding of bloody mucus in the uterine cavity in these cases is almost pathognomonic of cancer of the endometrium.

That atresia of the cervix may result in a serious state of affairs is illustrated by the following case:

The patient was a widow of sixty who had had two children. The menopause occurred fifteen years before. Six months before she was seen she had an acute attack of cystitis with pain in the lower abdomen. Frequent and burning micturition continued off and on with several acute attacks of pain which would lay her up for several days at a time. Five weeks before she had a profuse discharge of pus which she thought came from the vagina. At the time of the consultation she was having great urgency and frequency but passed only small amounts at a time. The examination revealed an irregular mass in the region of the gall bladder and right kidney, which was not very tender. Vaginal examination showed a board-like hardness in the pelvis with an irregular mass in the region of the bladder, about four inches in diameter. This mass was fixed, firm, and tender. The urine was loaded with pus and blood. The examination and urinary findings were those of a tumor of the bladder.

The cystoscopic report is as follows: Bladder capacity six ounces. The lining of the bladder over the trigone and one-half way up to the top is intensely red, edematous and thrown into folds. The right ureteral orifice could not be found. The left ureter was catheterized, injected with iodide solution and x-rays taken. The bladder was filled with barium solution and an x-ray taken.

The bladder urine contained pus and red blood cells. The left ureteral urine was negative.

The x-ray report was as follows: Both kidney shadows are normal in size and position. No calculi are seen in the region of the kidneys, ureters or bladder. The left pyelogram shows a normal kidney pelvis and calices. The lower two-thirds of the left ureter is dilated slightly. The cystogram shows an irregular bladder outline; the superior right and inferior margins reveal a shadow which is smoothly irregular, suggesting pressure from without. The character of the irregularity on the left side suggests an infiltrating growth in the bladder wall. Six rounded, faceted shadows are seen just above the right iliac crest, which are shadows of gallstones and a similar shadow is seen opposite the first lumbar vertebra which is probably a stone in the cystic duct. The x-ray diagnosis was a neoplasm involving the bladder and causing partial obstruction of the left ureter and hydrops of the gall bladder with stones. Ether examination done by Dr. W. P. Graves revealed an atresia of the cervix, with a pyometra.

It seems probable that in this case there was an extension of infection through the uterine wall into the paraecytic cellular tissue, which caused a chronic cystitis and infiltration of the bladder wall so that it could be felt as a tumor.

The treatment of vaginal atresia in general consists in the excision



of the inflammatory or scar tissue, the accurate closure of the wound, if possible, so as to prevent sepsis and more scar, and the maintenance of the caliber of the organ.

The inflammatory atresias of the pre-menopause type usually have a fairly definitely circumscribed area which can be excised. Then the tube is dilated manually. In most of them the vaginal lining can be sutured over the wound. In the others the wound must be kept clean and the dilatation maintained by suitable means to allow it to heal with as little sepsis and contraction as possible, or, if the defect is large and near the introitus, it may be covered by turning in skin flaps from the labia or buttocks. In all cases douches are necessary for clean healing. If it seems necessary to use means to maintain the dilatation we are accustomed to insert a glass plug of suitable size. The patient is kept in the hospital for about three weeks wearing the plug most of the time. She is instructed to wear it at night after she leaves the hospital during four to six weeks longer. This treatment results very satisfactorily.

The treatment of postmenopause atresias due to senile vaginitis is somewhat different. Here the lesion is not as a rule so deep as those which we have just spoken of. It is more of an adhesion of two surfaces together which need to be separated and kept apart until they are healed over. The other principle is to relieve the cause of the vaginitis, the partial atresia of the cervix and the perineum that obstructs free drainage. Therefore the treatment consists in breaking up the adhesions, dilatation of the cervix, and enlarging the introitus to make it funnel shaped, combined with gauze packing to keep the surfaces apart until healed. These patients may need office treatment after leaving the hospital for several weeks until the process is healed and there is no chance of a reformation of the adhesions. Another important point is that to maintain free drainage there should be no redundant folds in the vaginal lining to cling together and act as a dam. Therefore in such cases the excessive lining should be excised. This usually takes the form of a cystocele and rectocele operation, having due regard to not excising too much.

The complete atresias can usually be opened and kept open, especially after the menopause. Occasionally one is seen such as the following:

Married woman, forty-four years old, had had two children, the younger being ten years old. Beginning six months before consultation she did not menstruate for four months. In the next two months she flowed three times for from five to seven days each time, the last one being two weeks before. Two months before, she began to have pain in the lower abdomen which necessitated going to bed for two or three days at a time. She had no nausea, vomiting, fever, symptoms of pregnancy or any molimen during the period of amenorrhea. The examination showed an atresia at the upper part of the vagina with two pinpoint openings which would not admit a probe. At operation the atresia was so firm that it

was felt that the bladder or rectum might be torn into if attempts to get through it were continued. Accordingly a complete hysterectomy was done through the abdomen, thus revealing an atresia of the vagina about two centimeters long, starting just below the cervix. The uterus showed a little retained blood, most of it having been discharged two weeks earlier.

Cases have been reported where the vagina has been destroyed to such an extent that the formation of a new vagina was necessary, but they are rare.

The important point in treating a complete atresia of the hymen is to excise the whole hymen in order to be certain that there will be free drainage, and not to simply incise it which may allow it to obstruct again with great danger of infection. The treatment of the associated hematosalpinx is not standardized. The wall of the tube is thinned out so much that it is very fragile and it is usually adherent to surrounding structures. Its contents are very irritating to the peritoneum and easily infected so there is great danger of sepsis if the tube is torn with escape of the retained blood into the abdomen. If such a case is drained below first there is danger, as the uterus collapses, that enough tension will be put on the tubes to tear them where they are adherent with the escape of the retained fluid. Therefore some feel that it is wiser to do the abdominal operation first. On the other hand, as Graves points out, it is difficult to make a diagnosis of hematosalpinx while the vagina and uterus are dilated. It may be necessary to empty them before a definite diagnosis can be made. Therefore each case must be decided on the findings, remembering that gentle palpation is extremely important.

The technic of enlarging a tight or obstructing perineum is as follows: An anteroposterior incision is made in the middle, of one to two inches in length, half in the vagina and half outside. The skin and mucosa are undermined and the scar tissue, which is nearly always found, is excised and, if necessary, the perineal body is incised, a median episiotomy. Then special attention is paid to stopping bleeding after which the wound is closed from side to side, transversely. Silkworm-gut must be used to obtain a good result because, on account of the tension, the sutures must be left in for eight to ten days. Catgut always causes maceration, the tissues give way, the wound heals by granulation and the patient may be as badly off as before or have a tender scar.

We do not believe that it is generally realized that when plastic operations are done on the vagina at or near the menopause, allowance should be made for the atrophy which is going to occur normally at that time. If the introitus is made small it may shrink enough to cause dyspareunia later. This point applies also when plastic operations and a hysterectomy with removal of the ovaries are done at the same

time. We make it a rule to leave the perineum fairly lax with a funnel-shaped introitus in such cases.

Atresias of the cervix can practically always be treated by dilatation. They may contract again in the course of years but can be dilated when necessary. The type that is resistant to this treatment is that where an atresia has resulted from the use of caustics in the canal. The canal may become obliterated so that it cannot be found from the outside. A sensible operation used by Dartigne<sup>6</sup> in such a situation is the following: The bladder is stripped back from the front of the cervix up to the uterovesical ligament, or higher as necessary, care being taken not to open the peritoneum. The cervix is incised longitudinally in the middle until the canal is found and an amputation done at a suitable height to remove all the obliterated canal and scar tissue, leaving a patent opening to the uterine canal.

Of the cases reported in this paper forty-seven were operated on by Dr. W. P. Graves, five by various members of the staff of the Free Hospital for Women, and the rest by the writer, who is much indebted to Dr. Graves and the others for permission to use their material.

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198 COMMONWEALTH AVE.

(For discussion see page 660.)

## OCCIPUT POSTERIOR: A CASE ANALYSIS\*

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(Attending Obstetrician, New York Nursery and Child's Hospital)

**D**URING the period of six years from January 1, 1918, to January 1, 1923, there were delivered at the New York Nursery and Child's Hospital 9,374 vertex presentations. Of this number 5,392 or 57.5 per cent were L.O.A.; 2,383 or 25.5 per cent were R.O.A.; 959 or 10.23 per cent were R.O.P.; and 640 or 6.8 per cent were L.O.P. These figures show that 17.05 per cent of the vertex presentations in this hospital are primarily occiput posterior.

The foregoing percentages were derived from patients examined vaginally, and in practically all cases the diagnosis of posterior occiput was confirmed by the attending staff. I therefore believe them to be reasonably correct. A comparison of these figures with those of others is of interest.

Williams,<sup>1</sup> reporting from the service of Johns Hopkins, states that in 5,488 labors the posterior occiput was found 635 times or 11.03 per cent. He believes, however, that at the beginning of labor the incidence is probably twice this figure.

Cragin<sup>2</sup> found at the Sloane Hospital that occiput posterior occurred in 11.5 per cent of 2,000 cases examined during the first stage, but he believed that at the beginning of labor a figure of 17 per cent would be more nearly correct.

Edgar,<sup>3</sup> in 2,200 labors, found the occiput posterior in 89 cases or 4.04 per cent. I interpret his figures, however, to apply to the persistent occiput posterior.

The disparity in the foregoing observations is too small to discuss. It is sufficient to say that at the beginning of labor, the occiput is posterior in nearly one-fifth of vertex presentations, and as a potential of persistent occiput posterior deserves consideration.

Nearly all standard textbooks state that in the *great* majority of occiput posterior cases, anterior rotation will occur at some time during the course of labor. From my personal experience and from the figures I have obtained, I believe the word "majority" should go unqualified. In this series the occiput did not rotate to the front, except with artificial assistance, in 36.8 per cent of the cases.

When rotation takes place the individual case is no different than if the occiput had been anterior from the beginning of labor, except that the time of labor is usually longer, pelvic floor lacerations more extensive, and the intervention of maternal exhaustion and fetal distress more probable. It is the persistent occiput posterior that gives concern, and to determine what an analysis of this type of case would show, I have made the following critical study.

\*Read (by invitation) at a Meeting of the New York Obstetrical Society, May 13, 1924.

A series of 312 histories showing an original occiput posterior position was tabulated. Of these, 215 were primiparae and 97 multiparae. The R.O.P. position occurred 178 times or 57 per cent, and the L.O.P. 134 times or 43 per cent; a ratio of 3 to 2. Anterior rotation occurred spontaneously in the R.O.P. group 116 times or 65 per cent, in the L.O.P. group 81 times or 60 per cent, leaving 35 per cent and 40 per cent respectively, persistently posterior; a combined incidence of 36.8 per cent. This figure is three and one-half times larger than that usually given in our textbooks for the persistent posterior position, and I know of no explanation for such a wide discrepancy, unless there be variation in different localities and peoples.

Taking the series as a whole, 312 cases, operative interference was required 105 times or 53 per cent for R.O.P. group of 178 cases, and 78 times or 58 per cent for L.O.P. group of 134 cases. The persistent posterior groups required assistance in all save one case, a persistent L.O.P., an operative incidence of practically 100 per cent; while of the groups which had a spontaneous anterior rotation, the R.O.P. and L.O.P. needed help in 37.9 per cent and 33.3 per cent of cases respectively. This shows that the average high operative incidence of the occiput posterior as a class is confined to the persistent posterior group, where delivery without operation is a rarity.

TABLE I

OPERATIVE INTERFERENCE	R. O. P. 105 OR 53%:	L. O. P. 78 OR 58%
Operative Interference	R. O. P. rotating normally	43 or 37.9%
" "	R. O. P. persistent	62 or 100 %
" "	L. O. P. rotating normally	26 or 33.3%
" "	L. O. P. persistent	52 or 98.1%

TABLE II

METHOD OF ROTATION PERSISTENT POSTERIOR GROUP (115)	R. O. P.	L. O. P.
Scanzoni Maneuver	40 or 64.5%	22 or 41.5%
Manual Rotation	8 or 12.9%	11 or 20.7%
Version	7 or 11.2%	10 or 18.8%

NOTE: 10 cases delivered posterior; 5 rotated during forceps application in mid-pelvis; and 2 were cesarean sections.

Trauma to the pelvic floor is more frequent than in anterior positions, and for the 312 cases, some degree of laceration occurred in 172 cases or 51.9 per cent. These lacerations are more marked as a rule in the cases which must be rotated artificially, but even in the cases that rotate spontaneously the type of tear is often quite characteristic, extending laterally high up into the sulcus from which the occiput turned. Four third degree tears were listed. All were acquired through rapid delivery in the interest of the child. Three were in cases mechanically rotated, and one resulted from a medium forceps in a case which had turned spontaneously.



The maternal morbidity, which includes all cases showing a rise of fever above 100.4° F., unless absolutely proved not to be of obstetric origin, was 20.5 per cent. It was found to be 18.8 per cent for those that rotated and delivered normally; 21.1 per cent for the simple forceps cases; 27.7 per cent for the forceps with manual rotation; 30.6 per cent for the forceps with Scanzoni's maneuver; and 41.1 per cent for the cases of internal podalic version. Fever was transient in the vast majority of these cases listed as morbid, and there was no mortality.

The fetal mortality for the entire series of cases studied was 15, and included one child delivered by cesarean section which died of an intestinal obstruction on the fourth day. This mortality was confined entirely to the persistent posterior group, and, as such, represents a percentage of 14.1 per cent, against an average for the whole hospital service of 4 per cent, not including premature stillbirths.

TABLE III

TYPE OF CASE	MEDIUM FORCEPS WITH SCANZONI	HIGH FORCEPS WITH SCANZONI	VERSION	HIGH FORCEPS PERSISTENT POSTERIOR	MANUAL ROTATION MEDIUM FORCEPS
Fetal Mortality	2	3	6	1	2

Rupture of the membranes was found to occur in the first stage 181 times or 58 per cent, in the second stage 105 times or 33.6 per cent, and in 26 or 8.4 per cent the labor was listed as dry.

The pelves were listed as normal in size and form, in 81 per cent of cases. This figure is based upon the usual methods of pelvimetry, which, alone, I consider inadequate. To the many theories already advanced as etiologically responsible for the posterior vertex, it would be well to consider the factor of abnormal pelvic planes. Without facts, figures or a method with which such can be obtained, and appreciating that a posterior position may occur in one pregnancy and not in a subsequent one, still, I believe that the occiput rests posterior more frequently in that type of pelvis where the plane of inlet makes an exaggerated slant toward the plane of the horizontal. This type of pelvis, which is not rare, undoubtedly favors deflection, and deflection is an unquestioned element in the etiology of a majority of such cases.

It was not my purpose, when I started this study, to take up the management of these cases during labor, but certain statistics so properly belong there that a discussion of their value and application is necessary. The generally accepted division into prophylactic treatment or correction before labor and active treatment or correction during labor is observed. The former, the postural prophylaxis, as described by Reynolds<sup>4</sup> in his *Practice of Midwifery* (1892), is familiar to all and requires mention only. The application of this prin-

eiple loses value in that relatively few cases of posterior occiput are diagnosed before the onset of labor, and the procedure, which is painful to most patients, when applied is, for the most part, ineffectual.

With the onset of labor our first duty to these patients is to secure dilatation, engagement and spontaneous rotation. Nothing is more effective toward this end than that measure of rest and relaxation which it is possible to secure without actively interfering with the process of labor during the first stage. For this purpose morphine has been widely used. It can be administered alone or in a synergistic combination. Of the latter I believe the insufflation method of Gwathmey<sup>5</sup> promises much. This type of case, especially where the membranes rupture early or where dry labor frankly exists, furnishes also, at times, one of my very few indications for bags. I agree fully, however, with the findings of Dorman and Lyon<sup>6</sup> that with such use a decrease in morbidity is not to be expected.

Assuming these three conditions fulfilled, the case becomes an anterior occiput and properly leaves the scope of this paper. The majority can be so managed, but there remains an appreciable percentage, in this series 36.8 per cent, which will require an operative termination, and so will tax the most active ingenuity in deciding which type of operative delivery offers most for the safe conduct of both mother and child. Frequently, other factors enter to further complicate the situation. Dry labor or a very early rupture of the membranes, primary uterine inertia, and an unyielding cervix, singly or collectively, seemingly intrude into nearly every case. Directly, too, as these labors are prolonged, so rises the potential of maternal exhaustion, fetal distress, perineal trauma, hemorrhage and sepsis. Obviously, then, it is impractical to offer more than general suggestions for the management of the persistent posterior case as a class, and futile to say what the individual case will demand.

As previously stated the operative incidence for this series of 115 cases of persistent occiput posterior was practically 100 per cent. The several types of operation were divided as follows: 62 forceps combined with Seanzoni maneuver, 19 forceps combined with manual rotation and 17 internal podalic versions. This leaves 17 cases. Ten of these were delivered posterior, two by cesarean section, and five rotated in mid-pelvis through the vectis action of forceps application. The Seanzoni maneuver so exceeds all other methods of rotation in this series that more than a word of citation seems warranted. Though previously described, this type of forceps rotation was given prominence by Brodhead<sup>7</sup> in a paper read before this society in 1900. Though universally condemned in the textbooks of that time, this method was given favorable comment in the discussion which followed by Tucker, Cragin and Edgar. Almost the same statement may be made for the textbooks of today, Williams<sup>8</sup> alone giving this

maneuver his unqualified approval, though placing it secondary to manual rotation. De Lee<sup>9</sup> mentions it only to condemn it.

This difference of opinion has led me to go minutely into the question and to analyze closely our results. Employed 62 times in 115 cases; 40 of these were persistent R.O.P., and 22 persistent L.O.P. Five stillbirths resulted, a percentage of 8.06, and there were two third degree lacerations of the pelvic floor.

The fetal deaths occurred in difficult forceps deliveries, 3 high and 2 medium, done after long labors, and, in my opinion, the rotation in no way contributed to the result. The third degree lacerations resulted where rapid delivery was imperative in the interest of the child, and were justified by the fact that neither of these children was lost. Twenty-two first degree, and twenty-one second degree perineal tears also were noted, placing the total perineal disruption for this group at 72.5 per cent, a figure 19.2 per cent higher than that in the group where normal spontaneous rotation intervened. A comparison of perineal tears resulting from forceps delivery with the Scanzoni maneuver and forceps delivery as such shows a difference too trifling to discuss.

TABLE IV

		1ST DEGREE	2ND DEGREE	3RD DEGREE	TOTAL
Perineal Lacerations Whole Series	R. O. P. 178	44	44	3	51.1%
	L. O. P. 134	47	33	1	60.4%
Perineal Lacerations Normal Rotation	R. O. P. 116	33	26	1	51.7%
	L. O. P. 81	30	15	0	55.5%
Perineal Lacerations Artificial Rotation All types	R. O. P. 55	11	18	2	56.3%
	L. O. P. 42	17	18	1	85.7%
Perineal Lacerations All forceps without Scanzoni	(102)	30	33	1	62.7%
Perineal Lacerations Forceps with Scanzoni	(62)	22	21	2	72.5%

The maternal morbidity, for the most part inconsequential, was 30.6 per cent against 20.5 per cent for the complete series of cases studied. These figures, plus my personal experience, lead me to the positive opinion that the Scanzoni maneuver, when properly used, is a procedure of definite and certain value, and, though I do not urge its adoption over and to the exclusion of other methods of rotating the occipitoposterior vertex, I am convinced that a more general recognition of its importance is warranted.

Manual rotation is the usual method of choice for converting a posterior into an anterior occiput. Its field of application and technic of accomplishment are so well known that it is unnecessary to review

them further. In this series it was reserved, for the most part, for cases where engagement had not taken place. Most cases of this variety will require an immediate high forceps and prompt delivery. Manual rotation was employed 19 times with a fetal mortality of 10.5 per cent.

Version, with us, has been a last resort procedure in dealing with the posterior occiput case. Usually where delivery by the breech would be otherwise indicated, the patient has been long in labor, the uterus well contracted upon the fetus, the cervix poorly dilated, and the lower uterine segment thin, making a practically impossible condition for this type of delivery. Usually, too, a forceps application has been made which adds materially to the fetal risk. In this group, 17 cases, the fetal mortality was 35.2 per cent and the maternal morbidity 41.1 per cent; figures which speak for themselves, and which bear out the experience of others. Rotation by the two-forceps method is now advocated. I am familiar with this operation only through the literature, and, as yet, have seen no reason to adopt it.

In dealing with the occipitoposterior vertex, is it ever advantageous to deliver the fetal head as a persistent posterior? I believe that it is. Given, for instance, a contracted outlet with wide symphysis and narrow pubic arch, a typical funnel or male type pelvis, and an occiput posterior deeply engaged, this head can be drawn through with forceps, applied properly to increase flexion, and by aid of a deep episiotomy, with less trauma to the pelvic floor and less danger to the fetus than by rotation with forceps, a process which I consider here contraindicated, or manually, which is difficult, if possible at all.

In the occipitoposterior cases we frequently realize too late the existence of a positive indication for cesarean section. By being less conservative on this point and more careful in our preliminary manipulations of the patient, unquestionably many babies could be saved and much suffering, without added risk, spared to the mother. The transperitoneal and extraperitoneal types of cesarean section, by their applicability to the potentially infected mother, have greatly extended the indications for surgical intervention in obstetrics, and, for these procedures, the nonengaging occipitoposterior vertex, offers a particular field.

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27 WEST SEVENTIETH STREET.

(For discussion see page 656.)

## AN ENCLOSED BED FOR PREMATURE AND FEEBLE INFANTS\*

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THIS bed was designed with the idea of keeping the premature or feeble baby in a protected, portable, adjustable and accessible crib, providing uniformly warmed, suitably humid and well ventilated air, and which would also permit feeding, cleansing and heating of the babe without removal. The bed has been in use at the Brooklyn Hospital for the past year and a half, during which time twenty-five premature or feeble babies were cared for in it, with the loss of but one baby that died ten hours after birth and which was an R.O.P. position, the mother having had a long labor with a premature separation of the placenta. The babies treated in this bed were the smallest and weakest in the nursery at the time. In four cases of premature twins and one of premature triplets the smaller and weaker baby was placed in the bed and this baby averaged better than the others. In fact, in one case, the baby not in the bed lost so much ground it was finally placed beside the other baby and showed a gain almost immediately.

The bed consists of a large compartment, constructed of glass and metal, standing on four castored legs (Fig. 1). The top is a metal roll-top which closes the chamber except for a space at the end directly above the baby's head. At this end, there is an adjustable visor which shields the baby's eyes from the glare of the lights in the room. It runs on a bar which also serves as a handle for the bed. The wiring is concealed under the floor of the bed and the lights are controlled by means of a switch on the front. Our original bed was constructed of wood.

The bed or crib has metal sides and thin springy, steel strips across the bottom to hold the mattress. It is held in place by pegs, one in the center on either side, which rest in notches. By a lock-washer device, the crib can be raised or lowered at either end. The crib is so placed that it divides the large compartment into a lower or heating and moistening chamber and an upper or crib chamber. At the foot of the crib, there is a space through which the chambers communicate and where the thermostat, thermometer and hygrometer are placed.

The lower or heating and moistening chamber is fitted with four electric light bulbs in a line on the center of the floor, equidistant from each other. Circling each light, are seven one-half inch air intake holes, twenty-eight in all, the area of which is equivalent to one large hole eight inches in diameter. By means of two slides, two to twelve of these holes can be blocked off, leaving sixteen holes as the minimum air intake area, this being equivalent to one hole about five inches in diameter. Between the two center lights there is a tank, holding one and a quarter gallons of water with a frame on either side. On these frames, there is a

\*Presented, by invitation, at a Meeting of the New York Obstetrical Society, May 13, 1924.



strip of Turkish toweling, the center of which is immersed in the water through a slit in the cover of the tank. The toweling draws the water and is kept saturated, providing a large, constant evaporating surface. The front of the chamber can be opened so that all parts are accessible.

The upper or crib chamber is arranged to allow the utmost ease for the care of the baby and of gradually increasing the degree of exposure. The top can be pushed back and the front opened making for accessibility of the baby. The crib is adjustable. The glass at the head can be opened, as can a slide on either side, thereby obtaining complete exposure of the baby's head.

When the temperature in the lower chamber rises above that of the room, air is drawn into it through the holes encircling the lights. The warmed air rises and

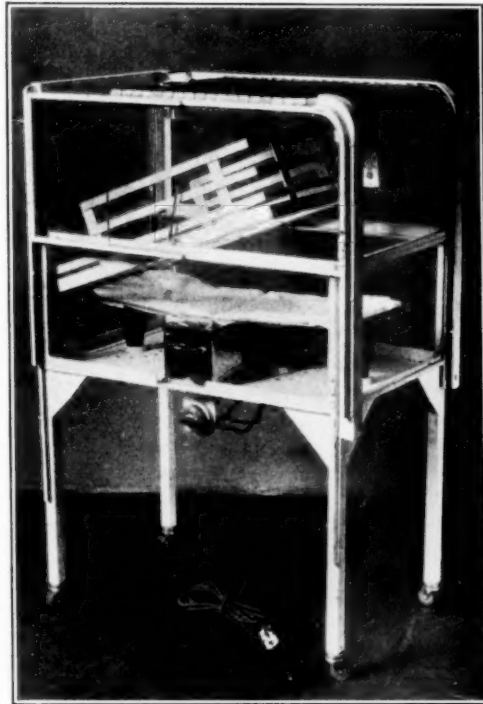


Fig. 1.

is moistened by the saturated toweling above the lights. This now warmed and moistened air, ascends to the mattress and is shunted along to the space at the foot of the crib where it enters the upper chamber. Here, the air passes under the roll-top cover and over the baby making its exit through the space over the baby's head. The baby breaths this warm and moist air. If the glass at the head and the slides on either side are opened an independent circulation of room air passes over the baby's head and mixes with that of the bed so that, towards the close of its premature stage, the baby can be acclimated to room conditions. A further step in this process is obtained by gradually pushing back the roll-top and opening the front when complete exposure is obtained. The special features to be noted are as follows:—

1. *Even Temperature.*—The bed is constructed for use in a room of average temperature which is too cool for a premature baby. A temperature, in the cham-

bers of 80° F. to 85° F. has given the best results. When the required temperature is obtained the occasional turning on or off of one or two lights will keep it at that point with very little variation. Where the thermostat is used the temperature is automatically regulated by placing the indicator at the desired point. In our original bed, no thermostat was used, yet very little attention was required, on the part of the nurse, to keep the temperature even.

2. *Humidity*.—For the humidity tests the wet and dry bulb hygrometer was used. The humidity of the air in the chambers will vary from 50 per cent to 65 per cent depending upon the temperature of the bed and the humidity of the outside air. No other premature baby bed, as far as I know, permits of the baby's breathing air of this humidity, in fact, the usual humidity of the air the premature baby breathes is that of the room which, during cold and dry weather, often falls to 30 per cent. I believe one of the main reasons for the success of this bed is due to the normal humidity maintained in the chambers. By this normal humidity, undue absorption of fluids from the baby's skin and mucous membranes is prevented and the initial loss of weight is, in a large measure, curtailed.

3. *Ventilation*.—Since the air in the chambers is drawn from the room through the air-intake holes, ventilation of the bed depends upon that of the room. However, during the airing of the room, the baby is protected from drafts and undue exposure which permits of longer and more frequent airings. One test will suffice to illustrate:—

Temperature before airing, room 78° F., bed 85° F.

Temperature after ½ hour airing, room 60° F., bed 82° F.

A drop of 18° F. in the room temperature with only 3° F. in that of the bed. No thermostat was used at the time of this test.

4. *Acclimation*.—As the baby nears the close of its premature existence, it can be acclimated to room conditions. This is accomplished by gradually reducing the temperature and opening the head, side slides, top and front of the upper chamber. This possibility of opening and closing the bed has been found very useful during hot days and cool nights.

5. *Adjustable Crib*.—The adjustability of the crib has proved useful during feedings and for babies with cyanosis or mucus. Much less regurgitation of food was noted when the head of the crib was raised at feeding time.

6. *Cleansing and treating of the baby without removal from the bed*.—By opening the top and the front, the baby is accessible for cleansings, changings, and treatments without the necessity of removing it from its warm bed.

7. *Sanitation*.—The bed can be easily stripped. The tank, crib and top can be removed and boiled and the remaining four walls can be washed with antiseptic solutions. The wiring and sockets can be readily removed.

8. *Safety*.—This bed is foolproof. The temperature cannot rise sufficiently to harm the baby. There is no danger of burns or suffocation.

9. *Simplicity*.—There is a minimum amount of work required, on the part of the nurse, in caring for the bed. Daily filling of the tank with water, apart from the usual care of premature babies, is all that is required. Hot water bags and hot blankets are dispensed with. There is no complicated mechanism to get out of order.

10. *Economy*.—After installation, the only cost is for current, and an occasional electric bulb and Turkish towel.

911 BEDFORD AVENUE.

## CONTRACTIONS OF THE PELVIC OUTLET NECESSITATING DELIVERY BY CESAREAN SECTION\*

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THE management of labor in cases of funnel pelvis will depend primarily upon the degree of contraction, although Newell has rightly emphasized a preliminary consideration of the size of the child, the ordinary malpositions such as posterior occiput, the age and psychic status of the patient, and other incidental features such as a previous extensive perineal operation. Moderate degrees of transverse contraction, in which the bituberal diameter measures more than 7 cm., are often corrected by an exaggeration of the posture which patients are accustomed to assume toward the end of the expulsive stage of labor. As the thighs are drawn up toward the abdomen and spread apart, the innominate bones rotate about the sacrum in such a way as to increase notably the capacity of the inferior strait. The most extreme lengthening of the posterior sagittal diameter thus obtained occurs when the patient is placed in the lithotomy position, and at times the posture assumed for a forceps operation is sufficient to permit spontaneous delivery. Similar enlargement is usually accomplished by the Sims' position. In about two-thirds of all cases of funnel pelvis postural treatment results in normal delivery or establishes conditions permitting a satisfactory delivery with the use of forceps. In other instances, the hindrance to the passage of the fetal head is not so easily overcome and a more radical procedure must be employed to effect delivery.

To illustrate this point, two cases which have necessitated the application of this principle are presented.

A white primipara was registered in the prenatal clinic at the eighth lunar month of pregnancy. The preliminary mensuration revealed a superior strait of normal dimensions, but there was a notable shortening of the bituberal diameter of the inferior strait (Fig. 1). Upon referring to the diagram, which is drawn to scale, it is seen that the transverse diameter of the extremely long and narrow arch measures only 5.75 cm., and that the posterior sagittal diameter measures 8.5 cm., totalling 14.25 cm., while the minimal compensating length is theoretically 9.75 cm. Granting that circumstances such as an abnormally small or premature child, or marked molding of the head might modify one's conclusions in the matter, it was clear that the vaginal delivery of a normal sized fetus at term would be sufficiently doubtful and dangerous as to justify the consideration of alternative methods. Under such circumstances pubiotomy has been advocated, for this operation not only permits of the delivery of the child, but in many instances leads to a perma-

\*Read at a Meeting of the New York Obstetrical Society, May 13, 1924.

nent enlargement of the inferior strait. On the other hand, the technical difficulty involved in the performance of pubiotomy may be considerable; there is danger of injuring the adjacent bladder and urethra, and moreover, since the healing of the bone wound occurs by fibrous union, interference with locomotion is possible. Accordingly, it appeared that delivery by conservative cesarean section offered the best immediate prospect for mother and child, as well as the most favorable prognosis for the subsequent maternal health and for anatomic as well as functional integrity. With these points in mind we employed a conservative section in this case with a satisfactory outcome for mother and child.

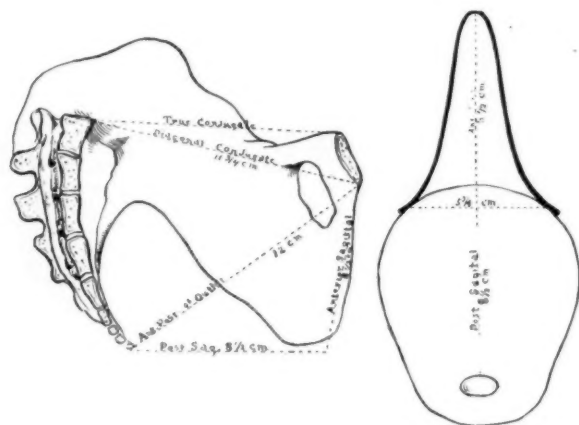


Fig. 1.—Diagrams of the pelvic outlet in Case 1, illustrating the necessity for delivery by cesarean section.

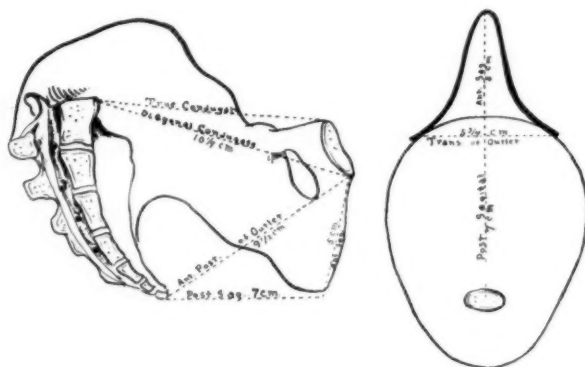


Fig. 2.—Diagrams of the pelvic outlet in Case 2, illustrating the necessity for delivery by cesarean section.

The second patient was a primiparous woman first seen at term. Because of the presence of an advanced osteomalacia, our immediate interest centered in the pelvis and its relation to the problem of the moment.

Most characteristic was the trefoil shaped superior strait with a diagonal conjugate of 10.25 cm. Such a diameter in itself might not prohibit normal delivery, but this pelvis presented a transverse inlet contraction also, thus reducing the available area to minimal limits. Turning then to the pelvic outlet, it was found that in contrast to rickets, with its flared arch and widely separated tuberosities, there was here an outlet contraction of extreme severity (Fig. 2). By re-

ferring to the diagram it is seen that a narrow pubic arch with a transverse diameter of 5.75 cm. forces the head so far posteriorly that the corresponding sagittal diameter assumes first importance. The latter measured only 7 cm., while the sum of the two measurements equaled but 12.75 cm., falling 2.75 cm. short of the minimal requirement of 15.5 cm. for spontaneous delivery. In this instance conservative cesarean section was performed, with wholly satisfactory results.

When one speaks of pelvic contractions the natural tendency is to think of deformities of the pelvic inlet or superior strait, for several reasons. (1) These deformities represent the most common types of pelvic contraction seen in practice. (2) Bony changes affecting the superior strait are characteristic of rickets, the most prominent etiological agent among all bone diseases. (3) Contractions of the pelvic inlet are more easily recognized, especially in late pregnancy, when maladaptation of the presenting part is obvious, even to such superficial examination as abdominal palpation. (4) The study of contractions of the pelvic inlet has been placed on a scientific and mathematical basis for a longer period of time, so that practitioners of the present generation are versed in such conditions; while the recognition, etiology and treatment of the abnormalities of the pelvic outlet is a relatively new field and the funnel type is the latest contribution to the accepted scheme of bony pelvic contractions.

However, since a contraction of the pelvic outlet, including all varieties, occurs in about 7 per cent of obstetrical patients, and since it is probably the most common form of bony pelvic pathology encountered among white women in this country, the pubic arch is always to be reckoned with, and should be measured routinely at the preliminary prenatal examination. Such a study is only complete when it includes the recognition of the general shape of the arch gained by digital palpation, confirmed by accurate mensuration of the bituberal diameter of the outlet. When the arch is wide and has a corresponding transverse diameter above 8 cm., further information is rarely necessary. On the contrary, if the arch is so narrowed that its bituberal diameter is 8 cm. or less, the length of the posterior sagittal diameter must be accurately determined. From a practical standpoint these are the two important diameters; and in a patient with a funnel pelvis the probability of a spontaneous delivery primarily depends not upon the absolute length of either diameter, but rather upon the relation which their measurements bear to each other.

*(For discussion, see page 658.)*



## THE CAUTERY TREATMENT OF CHRONIC CERVICITIS, WITH HISTOLOGIC STUDIES

By B. Z. CASHMAN, M.D., F.A.C.S., PITTSBURGH, PENNA.

**B**ECAUSE of the anatomic structure of the cervix uteri, deep seated infection in the cervical glands is difficult to eradicate except by radical measures. The futility of treating chronic infection in the tonsil by surface applications of antiseptics or caustics has long been realized and it is time that we realize the ineffectiveness of local applications for the cure of chronic cervicitis. In spite of all forms of office treatments the great prevalence and persistence of leucorrhea, which is the most prominent sign of chronic cervicitis, bears out this point. It is because of the persistence of deep cervical infection, its great prevalence and the morbidity produced by it that we now believe that it deserves radical treatment in all except the superficial infections. By radical treatment we mean complete removal of all cervical glands by amputation or by a much simpler method, complete destruction of all cervical glands with the cautery.

### TECHNIC

Hunner<sup>1</sup> first advocated making radial incisions with the Paquelin cautery at the external os and after healing had occurred other radial incisions and so on until the cervicitis is apparently cured. Dickinson<sup>2</sup> advises similar treatment with nasal cautery. Our procedure is to dilate the cervical canal thoroughly, thus stretching out the depressions which give the glands a much deeper appearance than actually prevails. We then aim to cauterize at one sitting the entire cervical canal for the depth of about 1/8 inch with a Downes electrocautery knife. At the external os, we make six or eight radial incisions about 1/4 inch deep and extending well on to the vaginal portion of the cervix, thus destroying the cysts and deep glands. We again dilate the cervix after the cauterization. This is not an office treatment.

### EFFECTS OF CAUTERIZATION

The question arises as to how deeply it is necessary to cauterize in order to actually destroy the infected glands, and to treat chronic cervicitis as a prophylactic measure in the prevention of cancer. In order to determine exactly what occurs as a result of this treatment with the cautery, we made the following observations:

CASE I.—Cervix was cauterized preliminary to supravaginal hysterectomy for fibroids. Six months later the patient was operated for bilateral inguinal herniae, the remaining cervix was removed and gross and microscopic examination showed



Fig. 1.—Chronic cervicitis. Before cauterization.



Fig. 2.—Chronic cervicitis. After cauterization.

complete stenosis of cervical canal and complete absence of cervical glands, showing that the procedure was efficient in destroying these structures.

CASE 2.—Chronic cervicitis. A section was removed for microscopic examination and the cervix then cauterized. This was followed immediately by amputation of the cervix for study of effects of the cautery. Fig. 1 shows the deeply infected glands before cauterization. Fig. 2 shows section of cervix immediately after cauterization. It is noted in Fig. 2 that the effect of the heat is evident at some distance from the charred area, the outline of the glands being preserved but the epithelium is destroyed. This procedure has been carried out in several cases with identical results.

CASE 3.—Cervix cauterized for chronic cervicitis, and the usual aftertreatment, consisting of weekly dilatations of the cervix carried out. One year later, patient was admitted to the hospital for tonsillectomy. The cervix was normal in appearance and cervical canal was patent. Menstrual periods were normal and there was no leucorrhea. While the patient was under anesthesia for tonsillectomy, the cervix was amputated. Sections through upper portions of cervical canal show it to be lined with columnar epithelium, and glands dip down a short distance into the stroma of the cervix. In lower portion of the cervical canal, squamous epithelium is found extending up from the vaginal portion of the cervix as is seen normally in the senile cervix.

The opportunity for re-operating these cases and studying the cervix microscopically has not been great and we submit this brief report in order to stimulate further study along this line. The question of what type of epithelium replaces the destroyed epithelium in the cervical canal and whether there is any regeneration of cervical glands, is important from a physiologic standpoint with reference to the possibility of future pregnancies. Case 3 showed definite short glands extending from the cervical canal after healing had taken place, suggesting regeneration of the glands, for our other observations make us feel sure that the glands were destroyed in the original procedure. The presence of squamous epithelium in the lower portion of the canal seems to indicate that in the epithelization of the granulating area in the healing process after cauterization, the columnar epithelium grows down from above and the squamous epithelium grows up from below. From our studies of the cervix after cauterization we feel that superficial cauterization with a nasal cautery is inadequate for the destruction of the cervical glands. It may seal in the deeper portions of the glands and cause cyst formation, and the deep infection, the lymphatic involvement and the possibility of cancer remain, although the leucorrhea will often be relieved.

#### AFTERTREATMENT

There are two important points in postoperative treatment. About a week or ten days after operation, there is at times a bloody flow which is not menstrual in origin. It is due to hemorrhage about the time of the separation of the slough. In five years' experience with this method, we have seen bleeding to the extent that we felt that active measures

were necessary to check it, in only four cases. Packing of the vagina readily controlled this. Usually when bleeding occurs, it is no more than is ordinarily seen at the menstrual period and no treatment is necessary. Severe hemorrhage is more frequent after amputation of the cervix than after cauterization of the cervix.

The other more important consideration is the prevention of stenosis of the cervical canal. Without proper aftertreatment of the cervix, stenosis will occur in a large percentage of cases. This occurs early, not from scar contractions, but from the growing together of two granulating surfaces. This occurs chiefly at the external os, and is manifested by cramps preceding the onset of the menstrual flow. In several cases in which there were severe cramps with no flow, we found complete stenosis at the external os. On inserting the dressing forceps through this, there was an escape of retained menstrual blood, and no stenosis found higher in the cervical canal. As a result of this experience, we now have these patients return four weeks after operation, at which time the slough has disappeared and there is a clean granulating wound, and under aseptic conditions, we pass a dressing forceps into the canal. They report for similar treatment every week for four or five times until epithelization of the canal is complete, and thereafter there is no trouble.

#### USES AND ADVANTAGES

Cauterization is applicable to all cases of cervicitis in which there is not too extensive laceration or deep seated cystic and fibrous changes in the cervix, in which cases amputation by the Sturmdorf method is preferable. It is the best and simplest method of treating chronic leucorrhea. The annoying persistence of leucorrhea even after removal of tubes, uterus or both, with the cervix left behind, has led us to cauterize the cervix in all operations for tubal infection. Chronic endometritis and metritis are practically always secondary in inflammation in the contiguous structures, the cervix and tubes, and it is only by eradication of both that we will get the best results. Complete excision of fallopian tubes combined with cauterization of cervix makes the necessity for hysterectomy much less frequent in pelvic inflammatory disease. It has been stated that cauterization of the cervix greatly diminishes the possibility of future pregnancy. Where it is necessary to remove the tubes, this is not a factor and we do it routinely regardless of the extent of the cervicitis, for the cervix is the original source of the tubal infection. In many cases of cervicitis, it is very evident on first examination that local antiseptic or caustic treatment is futile. In doubtful cases after a few weeks of local treatment it can usually be determined whether the condition will clear up by such local measures or whether surgical treatment is necessary. Excluding the acute and subacute and considering only the chronic gonorrheal infections, we feel that until we have some definite means of determining when the patient is cured,

the only sure method is by removal or destruction of the cervical glands. This is combined with cauterization of Skenes' glands and excision of Bartholins' glands when they are involved. Many cases of soreness in the lower quadrant of the abdomen with no history of definite attacks of salpingitis and with tenderness of the adnexa but no palpable enlargement or fixation, will be entirely relieved by this procedure.

We also cauterize preliminary to all supravaginal hysterectomies, for two purposes: (1) Immediate sterilization of the cervical canal, making a supravaginal amputation a safer procedure. (2) Destruction of cervical mucosa to prevent further leucorrhea, or cancer formation in the remaining stump. Panhysterectomy is a more extensive and serious procedure to the patient and with more chances of mishap and infection than supravaginal hysterectomy. Thorough cauterization of the cervix eliminates the necessity for panhysterectomy. In such cases, as deep cauterization as desired can be carried out, for with removal of the uterus postoperative stenosis of the cervix is of no importance and no postoperative dilatation of the cervix is necessary.

While education of the public may bring to us cancer of the cervix in its early stages, the only time when it is curable, it is doubtful whether we will ever handle the cancer problem until we begin to treat extensively the precancerous lesion, "chronic cervicitis." That cancer of the cervix is practically always superimposed on chronic cervicitis is generally admitted. Why should the cautery be reserved for cancer, when we can so readily cure the condition before there is cancer? Because of this, we frequently use the opportunity to cauterize the cervix for cervicitis in patients who come to us for other conditions requiring operation, such as, hernia, chronic appendicitis, cholecystitis, etc. The chief advantage of this method over the equally efficient method of Sturmdorf is its simplicity and the absence of bleeding at time of operation. With the cervix fixed by parametrial involvement in the chronic inflammatory process, the Sturmdorf procedure may be difficult and time-consuming and considerably prolongs the operation where removal of tubes and other intraabdominal work is to be done. The advantage of cauterization over radium treatment of the cervix is the more definite control of the action of the agent used and its limitation to the cervix.

Cauterization can be done under local anesthesia or at least under nitrous oxide analgesia. There is no after-pain and the patient is confined to the hospital for only a few days. Patients readily assent to this and as a rule prefer it to the prolonged periods of office treatment with uncertain results.

#### DISADVANTAGES

There is, of course, an increase in vaginal discharge during the sloughing stage. This varies greatly, and in many cases is not sufficiently great to attract the attention of the patient. Vaginal douches relieve



this condition. The possibility of hemorrhage is present, but as stated above has never been serious in our experience, and can readily be controlled, if necessary, by packing the vagina with gauze. The most annoying disadvantage is the necessity for postoperative dilatation of the cervix. This procedure is painful. Most patients stand it very well, but in the hypersensitive individuals a dilatation under nitrous oxide analgesia, such as is used by dentists for filling teeth, is preferable.

#### RESULTS

The conversion of a moderately lacerated cervix with large "erosion" and profuse mucopurulent discharge into a normal looking cervix resembling the nulliparous cervix, with no discharge, is really remarkable. Leucorrhea is eliminated in the great majority of cases. That there are certain cases of persistent leucorrhea when cervix and uterus have both been removed is well known. We have had a few cases apparently of this type, where the cervix looked normal and leucorrhea persisted. Cauterization of cervix is ineffective in the treatment of leucorrhea if infected tubes are not removed. With these exceptions and with the exception of those cases that are reinfecting from their husbands, persistent leucorrhea means incomplete cauterization. But in a great majority of cases there has been complete cure of leucorrhea, sacral backache and dyspareunia. We have had a number of cases of pregnancy following cauterization, two of these after eight and ten years of apparent sterility, respectively. These cases were delivered without difficulty. By the appearance of the cervix, and the scar tissue chiefly in the region of the external os, we feel that there should be no more and probably less dystocia in these cases than in trachelorrhaphy or in amputation of the cervix.

#### CONCLUSIONS

1. Chronic cervicitis. Except in the superficial infections, it is curable only by eradication or destruction of the deep glands of the cervix.
2. Cauterization of the cervical canal with careful aftertreatment is the simplest and most effective procedure for its cure.
3. The cure of chronic cervicitis is the most potent prophylactic measure in the elimination of cancer of the cervix.

#### REFERENCES

- (1) *Hunner*: Jour. Am. Med. Assn., 1906, xlv, 191. (2) *Dickinson*: Trans. Am. Gyn. Soc., 1921, xlv, 334.

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## DOUBLE UTERUS

BY C. VAN ZWALENBURG, M.D., THOMAS A. CARD, M.D., AND  
W. A. JONES, M.D., RIVERSIDE, CALIFORNIA

**C**OMplete, double uterus in the human is an interesting anomaly and sufficiently rare to be made a matter of record.

Mrs. C. McP., age 35, gravida 2, was admitted to the Riverside County Hospital, suffering with pain in the right lower quadrant of the abdomen, of several days' duration. Her past history was uneventful except for the usual children's diseases. Her menses became established when 17 years of age, every 21 days, of 5 days' duration. No clots or pain previous to the birth of her child. She was married at twenty-two, and denied venereal infection. Her first pregnancy was at the age of twenty-three and terminated spontaneously at term. Puerperium was uneventful. Menses reestablished twelve months later with a twenty-eight day cycle and moderate dysmenorrhea. Her second pregnancy occurred three years later. This pregnancy, in contrast to the previous one, was marked by severe pain in the lower right abdomen. There were extensive varicosities of the lower extremities and vagina. Nausea was excessive. Spontaneous abortion occurred at the fourth month. The puerperium was uneventful except for lochia which continued for three weeks. Six weeks later her menses reestablished alternating twenty-one and twenty-eight days' cycle. The periods were characterized by pain, clots and severe headaches. Between periods there was copious yellow leucorrhea and almost continuous backache. Her present illness began several days before entrance. A diagnosis of pelvic inflammatory disease had been made by her physician who had advised hospital care. Her last menstrual period was one week previous to admission and of seven days' duration.

The physical examination was negative except for tenderness in the lower abdomen, more marked on the right side. Vaginal examination showed moderate yellowish grey discharge at vulva. The perineum was moderately relaxed. Cervix large and apparently lacerated. Pelvic examination proved very painful and thorough examination could not be made. However, to the right of what was taken for the uterus, an oval-shaped mass could be felt, behind and lateral to the symphysis. This was diagnosed as a probable right tuboovarian abscess. The left adnexa were tender but no palpable masses were found. Rectal examination as above. A speculum examination was omitted. Temperature on admission, 9:30 A.M., 97.8° F., at 1:30 P.M., 100.4° F. On admission W.B.C. was 18 000, R.B.C. 4,490,000. Twenty-four hours later W.B.C. was 13,000. Urine examination was negative except for some increase in pus cells and a few granular casts. Microscopic examination of smear of vaginal discharge, reported after operation was performed, showed gram negative diplococci present. Diagnosis made was pelvic inflammatory disease, subacute.

A midline suprapubic incision was made, permitting good exposure of the pelvis. Inspection showed the presence of two complete uteri with cervixes loosely joined. Each body had one laterally situated tube and ovary. There was no evidence of a tube or ovary from the mesial horn of either body. The right tube and ovary were involved in a tuboovarian abscess which ruptured while being delivered, and about 20 c.c. of pus was evacuated. The left tube showed considerable congestion. The left ovary was apparently normal. A total hysterectomy, left salpingectomy and right salpingoophorectomy was done. The abdomen was closed with drainage.

The postoperative course was uneventful for ten days, after which the patient complained of abdominal pain and distention. Her temperature became elevated

and clinical evidence of ileus developed. The abdomen was reopened and several coils of small intestines were found adherent by plastic exudate. These were freed but a recurrence of the condition several days later caused her death.

The illustration (Fig. 1) shows the specimen to be made up of two distinct uteri only loosely joined together at the cervix. Each body is slightly anteflexed. The left fundus measures 5.5 cm.  $\times$  4.5 cm.  $\times$  3.5 cm. The ora are separated 3 cm. The left os shows old radial healed lacerations. The right os is open but shows no visible lacerations. The right fundus is decidedly smaller and more vestigial in character. One fallopian tube is given off from the lateral side of the fundus. The right tube and ovary are joined together in a tubo-ovarian abscess. The left tube is infected but no macroscopic pus is

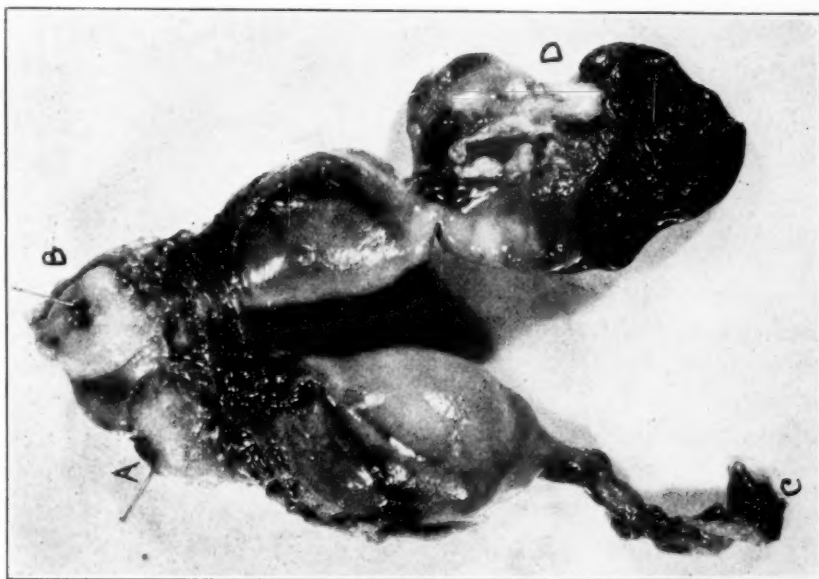


Fig. 1.—Double uterus with right pyosalpinx and left salpingitis. A, left os; B, right os; C, left fallopian tube; D, right tuboovarian abscess.

present. The patency of each tube was tested by passing a probe through each lumen to the fundus.

The woman had two pregnancies, one normal, and the attending physician made no comment of any abnormal development of the other, which resulted in an abortion at four months. An interesting speculation might be indulged in as to which of these bodies carried the pregnancies. It seems reasonable to suppose that the first, normal pregnancy occurred in the left or larger uterine body, the cervix of which bears evidence of laceration. On the other hand, the second pregnancy, complicated by severe varicosities and severe pain and terminated by abortion at the fourth month, very probably was of the right uterus.

GLENWOOD BLOCK.

## HYDATID MOLE WITH SPONTANEOUS RUPTURE OF THE UTERUS\*

BY IRVING B. KRELLENSTEIN, M.D., NEW YORK, N. Y.

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IN reviewing the literature, I find that only four cases of spontaneous rupture of uterus from hydatid mole so far have been reported. These cases are as follows:

1. Seitz (1904) *Handbook of Obstetrics*: patient died.
2. Lord (1868) *Edinburgh Medical Journal*: patient died.
3. R. C. Harkness (1921 *British Medical Journal*): girl, twenty-seven, gave a history of continuous and profuse "flooding" beginning with menstrual period and lasting four weeks. Patient became anemic, and abdomen was rigid and distended. Because of the acute signs, abdomen was opened and peritoneal cavity was found full of blood. Perforation was discovered on the posterior wall of uterus. Hysterectomy was done. Patient recovered.
4. Waldo (1910) *American Journal of Obstetrics*: diagnosis in this case was ruptured ectopic. On opening the abdomen, uterus was found to be twice as large as uterus should be at the end of the third month. Hysterectomy was done. Patient recovered.

Spontaneous perforation of the uterus, due to hydatid mole, is a very rare condition. The following case presented by me, and operated upon by Dr. Seeligmann, makes it a fifth case in the literature.

Mrs. A. has two living children. Was pregnant November, 1921, was curetted by her family physician who removed a normal ovum with well-developed chorionic villi, the ovum being about six weeks old.

The patient admits having had intercourse shortly after. She was seen by a well-known gynecologist when her period did not return in December, who said that she was pregnant again and had small fibroids besides. The patient did not menstruate in January and also in February till the time of admission into the hospital. The morning before admission, patient woke up with a very violent sudden pain in the lower abdomen, in no particular spot, but as she described it, all the way across the abdomen. Also had spasmodic bladder pressure. Her family physician saw her in the morning and found her in collapse; visible mucous membranes, exceedingly pale, skin waxy, pulse very weak, at times hardly palpable, but remarkably slow. She arrived at the hospital at noon with a diagnosis of ruptured ectopic. On admission the temperature was 99.6, the pulse at times hardly palpable, but slow. Percussion apparently showed free fluid in the abdomen which, however, was not very much distended. The uterus was found to be thick, doughy and larger than it should have been according to the history of a two months' pregnancy. No swelling could be felt corresponding to either one of the fallopian tubes. Douglas seemed empty, so that the possibility of an intrauterine pregnancy with beginning abortion was discussed. Because of the extreme pallor, and the free fluid in the abdomen, it was decided to operate. Beginning at the time of the incision, the patient was given an intravenous infusion.

\*Read at a meeting of the Bronx County Medical Society, May, 1924.

The abdomen was found full of blood. The intestines were covered with clots and fluid blood, the total of which must have amounted to one quart. After scooping most of this out, lying on the intestines was found a mass of hydatid mole. The uterus showed two perforations in the fundus between the origin of the fallopian tubes (Fig. 1). Out of these two openings came small hydatidiform bladders. Both fallopian tubes were absolutely normal, thin, pale and patent. It was evident that there was no ectopic, but that one had to deal with



Fig. 1.—Hydatid mole protruding through rents in uterine wall.



Fig. 2.—Cross section through uterus showing upper pole markedly thinned by hydatid mole.

a *mola hydatidiforme destruens*, which had perforated the uterine wall, the peritoneum and caused this tremendous hemorrhage. The palpating finger at the fundus felt the thinnest kind of a uterine wall around and between the two perforations. A subtotal hysterectomy was done, both uterine appendages being normal were left and stitched on to the stump. Patient made an uneventful recovery.

The specimen was examined by Dr. Milton Goodfriend at the Lebanon Hospital, whose report is as follows:



Specimen received in formalin. Consists of a uterus, the size of a three months' pregnancy. Surface of the uterus is smooth and regular. Consistency of the specimen has been changed due to formalin preservation. At the upper pole of the uterus is a small perforation through which are projecting a few grape-like masses. On section of the uterus, the wall at the upper pole is found to be markedly thin and has numerous grapes intimately attached to it. (Fig. 2.) The lumen of the uterus is filled with a large mass of this grape-like tissue. Microscopic section of the wall in the region of the rupture shows a marked thinning, only a few muscle fibers remaining. The muscle shows a moderate hyaline degeneration. There is an infiltration with round cells and an occlusional pus cell. No infiltration of the muscle by these grape-like masses. Section of the grape-like mass showed a collection of cysts of varying sizes filled with a clear fluid. The epithelial lining of these cysts is flattened in areas so as to be scarcely discernible.

The differential diagnosis of hydatid mole is not easy and cannot positively be made unless there is an escape of vesicles from the uterus. To the long list of diseases which have to be considered in making the differential diagnosis of ruptured ectopic, we must add rupture of uterus from hydatid mole. It may be extremely difficult to make a diagnosis. Hysterectomy is the operation of choice, for in these cases the wall of the uterus is so markedly thinned out, especially around the perforation, that to attempt to suture up this opening would be dangerous.

This case shows the importance of differentiating spontaneous perforation of a hydatid containing uterus from ruptured ectopic and that hysterectomy is the only feasible operation for such a case.

I desire to thank Dr. Seeligmann for permission to present this case.

1022 FAILE STREET.

## INDEPENDENT FIBROMYOMATA OF THE BROAD LIGAMENT

BY HOMER CARLTON SEAVER, M.D., F.A.C.S., LOS ANGELES, CALIF.

THE broad ligament is frequently the seat of pelvic neoplasms; fibromyomata, cysts, sarcomata and lipomata are found in this location. As would be expected, fibromyomata are the most frequent of the solid tumors. In practically all cases, however, these tumors occur as extensions from the uterus through the folds of the broad ligament. There can be found in the broad ligament a definite connecting link between the tumor and the uterus, and the latter structure is apt to present other growths. Occasionally, however, the tumor originates in the fibromuscular tissue of the broad ligament itself, and is in no way connected with the uterus; that is, it occurs as an independent fibromyoma of the broad ligament. It is this type of tumor which will be discussed in this paper.

The following case is reported because of the interesting phases of the differential diagnosis, the complications which followed the operation, and particularly because of the unusual type of tumor found.

Mrs. F. D., age forty-seven, married, housewife, was first seen on September 9, 1921; her complaint at that time being severe pain in the abdomen, fever, and failure to menstruate.

There was no family history of tuberculosis, malignancy or pelvic tumor of any character.

She had measles during childhood, and an occasional attack of tonsillitis, but no other diseases. She had had no operations. Menstruation commenced at the age of eighteen; was always regular, occurring every 28 days and lasting 4 days. During the first four or five years there was slight pain on the first day of the flow, but since then there has been no pain. There was no history of menorrhagia or metrorrhagia. She had never had leucorrhea. Her last menstrual period was on June 1, 1921, (that is, three months previous to the time she was first seen).

The patient has been married for 25 years. There was one pregnancy at twenty-three, which resulted in a spontaneous miscarriage at three months. There were no symptoms or signs of infection following this miscarriage.

For the past two years, at intervals of two or three days, the patient has had "severe attacks of gas on the stomach." These attacks usually lasted from three to four days, during which time she was constipated and occasionally nauseated, with two or three "vomiting spells." There had been no jaundice at any time and no abdominal pain. For the past three months, the patient has had urinary frequency, having to get out of bed three or four times every night; but there has been no pain or burning on urination.

The history of the present illness is as follows: On September 3, 1921, while on a holiday at the beach, the patient was seized with a severe, cramp-like pain in the right, lower, abdominal quadrant. The temperature was 100.2° F. and the leucocyte count 14,000.

The physician who examined her found no pelvic mass, made a diagnosis of pelvic peritonitis, and for the following six days the patient was kept in bed

and was given hot vaginal douches and sedatives. There had been one normal bowel movement every day. During this time the temperature remained at about the same level. Four days later there was a rise in the leucocyte count to 15,200,



Fig. 1.—Cut surface of tumor showing fibrous and hemorrhagic areas.



Fig. 2.—Left surface of tumor, showing ragged areas to which were attached various viscera mentioned; small projection at left is contracted vessels contained in pedicle.

with 70 per cent polymorphonuclear cells. The pain in the right side continued almost constantly, occasionally extending to the left lower abdominal quadrant. There had been no nausea or vomiting. The patient and her husband were both

worried because of the fact that she had not menstruated for three months. There were no other symptoms of a beginning menopause. There had been no vaginal bleeding.

When first seen by the writer, the patient was lying in bed, conscious, but apparently suffering a great deal of pain. The temperature was 102° F. The pulse was 98, of good quality, and regular. The general examination was not important.

*Abdominal Examination.*—There was slight rigidity over the entire abdomen, more marked throughout the lower right and central portion. There was no tenderness in the upper abdomen, very slight tenderness in the left lower quadrant, and very marked tenderness on superficial palpation over the entire right lower quadrant, where there could be felt a large, irregular, firm, fixed mass which extended upward from the pelvis to the level of the umbilicus. The percussion note over this mass was flat, but throughout the remaining portion of the abdomen it was resonant.

*Pelvic Examination.*—Outlet: small, no cystocele. Perineum: firm. Urethral orifice: normal in appearance. Cervix: firm, not lacerated or eroded, points anteriorly, freely movable, not tender, and presents no discharge. Uterus was of normal size, normal contour and consistency; pushed to the left side and fixed in midposition; tender on attempted movement. There was nothing abnormal felt in the left fornix. Filling out the right fornix, and extending over into the culdesac could be felt a very firm mass of fibroid consistency which was very tender and fixed and seemed to be a part of the abdominal mass described above. There was one small area of fluctuation over the portion of the mass in the culdesac, but this was not more tender than other parts of the tumor.

In four hours the leucocyte count rose from 15,200 to 17,400, with an increase of polymorphonuclear cells from 75 to 85 per cent. The urinalysis was normal except for a very slight trace of albumin. Blood pressure: 130/76.

The patient was taken to the hospital, prepared for operation and anesthetized with ether. An exploratory vaginal puncture was first made over the fluctuating portion of the pelvic mass and about 10 to 15 c.c. of serosanguineous fluid was removed. The patient was then put in the Trendelenburg position and the abdomen opened by a midline incision.

*Abdominal Findings.*—Occupying the right lower abdomen and pelvis was the large, firm hemorrhagic mass to be described below. Two loops of small intestine, the sigmoid, both tubes, ovaries and broad ligaments, the posterior surface of the uterus, parietal peritoneum, the appendix, and cecum were densely adherent to the mass. The base of the appendix and the adjoining cecum were indurated and very friable; the appendix being deeply injected throughout.

The tumor was attached to the posterior surface of the broad ligament, close to the right tube and ovary, about two inches from the uterus, by means of a small, friable pedicle which contained large, twisted, blood vessels.

There were no other tumors in, or connected with, the uterus, tubes, ovaries or broad ligaments.

The mass was, with some difficulty, separated (by blunt finger-dissection) from the surrounding tissues to which it was attached, and delivered into the incision. This procedure left a number of raw areas on the intestines to which portions of the sac were attached. Instead of attempting to make a clean dissection at these points and expose the serosa, thus leaving new bleeding surfaces, these areas were left undisturbed.

The pedicle was ligated with No. 2 chromic catgut and the tumor mass excised. It was impossible to invaginate the appendix in the usual manner on account of the friability of its base and the adjoining cecum, so, after the excision,

its stump was thoroughly cauterized with carbolic acid and alcohol, and left in place.

The abdomen was closed in layers, in the usual manner; using a continuous No. 2 plain catgut for the peritoneum and interrupted for the muscle; No. 2 chromic catgut interrupted figure of eight sutures for the fascia; silkworm tension, and continuous mattress sutures of dermol to the skin.

*Description of Specimen.*—The specimen consists of a slightly flattened, firm, spherical mass, measuring 11×8 cm. The surface is dark red. The serosa strips off easily. Section shows at one end, firm, gray tissue, comprising only a small part of the whole tumor. The remainder is softer, dark red, hemorrhagic, but traversed by strands of fibrous tissue. In the gray tissue is a small, softened, myomatous appearing area. Sections from the firm portion show interlacing bundles of fibers. Van Gieson's stain shows no muscle fibers. In the red portion the fibers are largely necrotic and much blood is present.

*Pathologic Diagnosis.*—Fibroma.

Except for a marked nervousness and insomnia and the fact that there was somewhat more abdominal distension than usual, the first ten days of the patient's convalescence were very satisfactory. The tension sutures were removed on the tenth day and the wound found to have healed by first intention. Throughout this period there was a slight elevation of temperature each day, but never above 99.6 F.

On September 21st, or the eleventh postoperative day, the patient complained of severe pain in the left groin which extended down the inner side of the thigh to the back of the knee. This was followed by a rise in temperature to 100.2° remaining at practically this level for six days. With this rise in temperature, there was an increase in the leucocyte count from 14,000 to 18,500 with a corresponding increase in the polymorphonuclear cells from 75 per cent to 85 per cent. Examination showed the leg and thigh to be markedly swollen; with slight redness over a small area below Poupart's ligament, and in the popliteal space; and a definite tenderness not sharply localized, extending down the inner aspect of the thigh for about six inches. The leg and thigh were bandaged from the toes to the hip with cotton, elevated, and immobilized in pillow splints, the pain subsiding after three days.

On September 27th, or the seventeenth postoperative day, the patient complained of sudden pain and soreness in the right thigh. The temperature rose to 101.2 with a slight rise in the leucocyte count to 18,800, but with no increase in the polymorphonuclear cells. Examination showed the same findings as those given for the left leg, except that the swelling was not so marked. The same treatment was applied and the pain disappeared in three days. There was a gradual decline in temperature for four days and then it varied between 99 and 100.2 until October 12th, (the thirty-second postoperative day, or the twenty-first day after the development of signs of phlebitis), when it reached normal and remained so.

On September 30th, because of restlessness and sleeplessness, the patient was given 5 grs. of veronal, and this was repeated in 6 hours. Following it, the patient became drowsy and lethargic, and remained in a semi-comatose condition for two days; it being difficult at all times to arouse her. Reflexes were all normal; there was no neck rigidity or other signs of a beginning meningitis. On the third day her mental condition became normal again.

On account of her phlebitis the patient was kept in bed for three weeks after the temperature had become normal. Examination three months after operation showed an entire absence of swelling of the legs. Pelvic examination at this time showed the cervix to be anterior, freely movable, and not tender. Uterus; normal size, anterior, freely movable, and not tender. There were no masses or tenderness



in the fornices. The patient reported that she had no abdominal pain and only two or three attacks of "gas on the stomach" since leaving the hospital. Two years after operation, the patient reports that she is enjoying perfect health. There has been no pain or swelling in the legs, and no abdominal symptoms.

The principal conditions which had to be considered in making a diagnosis in this case were: (1) appendicitis with abscess formation; (2) ovarian cyst or fibroid tumor on a twisted pedicle; (3) pelvic inflammatory disease, and (4) extrauterine pregnancy.

The three months' period of amenorrhea, without other menopausal symptoms, and the presence of a unilateral pelvic mass necessitated the consideration of the latter condition. This was, however, the most unlikely diagnosis, because of the age of the patient; the lack of vaginal bleeding, the absence of softening of the cervix, the comparatively high temperature, the fact that the patient considered pregnancy impossible, and that this would not account for the gastric symptoms which had been present over such a long period of time.

An atypical appendicitis with abscess formation could account for the patient's symptoms, but the leucocyte count at the beginning of the attack was low, there was no nausea or vomiting and there was no history of a previous attack, and the mass was not as tender as a recently formed sac of pus should be. Tubal infection was improbable because there was no history of infection following abortion or labor; and there were no symptoms or signs of a gonorrheal infection. The entire picture seemed more apt to be due to an accident to an already present pelvic tumor of some sort. But this diagnosis could not be made positively, because of the assurance of the physician who examined the patient at the beginning of her attack, six days previous, that there was no pelvic mass present at that time. However, after an ether examination, the diagnosis of pelvic tumor was made.

It is questionable whether or not the mental symptoms following the ingestion of two ordinary doses of veronal could be attributable to poisoning due to that drug. However, since there were no signs pointing to organic trouble, and since the symptoms disappeared after two days, we must consider that there was an idiosyncrasy on the part of the patient towards veronal. Ordinarily we would expect the development of toxic symptoms only after the taking of large amounts of the drug, or in case of an idiosyncrasy, after taking the first dose. An interesting fact in this case is that during the previous month, at intervals of four to five days, the patient had taken an equal amount of veronal without injurious effects.

The question of postoperative thrombosis will not be discussed in detail. The presence of a hemorrhagic and fibroid tumor on a twisted pedicle, the inflamed and friable appendix, the separation of recent and dense adhesions, and menopausal age, are factors commonly given

as tending toward the production of thrombosis. Throughout the first ten postoperative days, there was a slight elevation of temperature which conforms to the findings of Wharton *et al* in their review of postoperative thrombosis.

Recently I have examined another woman who, I believe, had a solitary fibroma of the broad ligament. The patient was thirty years of age, had been married four years and had never been pregnant. There were no symptoms referable to her pelvis, except a slight cervical discharge. She was seen because her doctor found on a routine examination, a pelvic tumor. Examination showed a very small, anteverted and anteflexed, infantile type of uterus of normal consistency, and freely movable. The left adnexa were normal. In the right fornix, about two inches from the fundus, was a firm, fairly regular mass about the size of a lemon, which seemed to be in the folds of the broad ligament, and in no way connected with the uterus. The right ovary could be palpated independently of the mass. The patient left town and has not been heard from, but it seems, on account of the infantile uterus, the consistency of the mass, and its apparent independence of the uterus and the ovary, that it was probably an independent fibroma of the broad ligament.

Communications from a number of the large gynecological clinics of this country indicate the extreme rarity of this condition. One writer states that he finds several independent fibromyomata in his records, while another mentions one case. All of the others cite no cases but emphasize the unusual condition which was brought out by Lynch and Maxwell in their recent monograph on pelvic neoplasms.

Virehow mentions the development of these solitary growths from a pathologic standpoint. The first clinical case to be reported was that of Burnham in 1867. In 1895 Senn found eleven cases in the foreign and American literature. Up to 1907 there had been only twelve American cases reported. Vance reviewed these, and his own case was included in Doran's later compilation of thirty-two cases. Since then McNeile and Hamilton have described two cases, and there have been two or three other cases cited without detailed description.

Some observers claim that these tumors always have their origin in the uterus, that they gradually extend outward into the folds of the broad ligament until final separation takes place, the nutrition being then derived through the ovarian circulation. Their independent origin, however, is accepted by most authorities, because there exists in the broad ligament itself fibrous and muscular tissue which forms the basis of such tumors. The most frequent site is that part of the broad ligament nearest the uterus where muscular tissue is most abundant, and consequently these are more richly supplied with muscle fibers. When the tumor originates in this location, it is more apt to have a sessile base. Most of the foreign cases, and practically

all of the early American cases, including those of Boveé, Shaw, Goldspohn, Harpel, Vance, and a later one reported by Hamilton, were of this nature. Rarely they originate in the outer portion of the broad ligament where muscular tissue is sparse. G. E. Shoemaker reported a case of pedunculated fibrosarcoma which possibly originated in an independent fibromyoma of the broad ligament. McNeile's case was also pedunculated. So that, with the early cases (Miculiez, Sanger, Bilfinger, Dolores, Tait, and Deletrez) there have been reported only about a dozen cases where the tumor was attached by means of a pedicle.

The age incidence is that of uterine myomata, that is, between thirty and fifty. They are practically always unilateral and contain as a rule much less muscle tissue than the corresponding growth in the uterus. Some of the early cases reported were quite large, weighing between ten and forty pounds. But the majority, especially those reported later, were much smaller. These tumors grow slowly, and consequently the symptoms which are usually due to pressure, develop gradually. They are subject to the same accidents that occur to similar tumors in the uterus, that is, infection, twisted pedicle, and the various types of degeneration. The prognosis after surgical removal is good.

The first case reported in detail above is the only one I have been able to find of a pure fibroma of the broad ligament, of independent origin, on a twisted pedicle resulting in a hemorrhagic necrosis.

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1136 W. 6TH ST.

## SPONTANEOUS VERSION

BY PALMER FINDLEY, M.D., F.A.C.S., OMAHA, NEBR.

**T**HE accompanying illustrations give evidence of a spontaneous version at full term.

In Fig. 1 is seen a breech presentation (L.S.P.), the occiput lying under the right costal arch. When I first examined the mother she



Fig. 1.—Breech presentation. Left sacro-anterior position.

was suffering severe pain in the region of the gall bladder. Her home doctors, three in number, could not come to an agreement on the diagnosis and the case was referred to me. A skiagraph was

made to settle the controversy and the patient remained in the Presbyterian Hospital of Omaha awaiting delivery. Two days after the first skiagraph was taken the patient recited in a most graphic manner how in the preceding night the baby became unusually active, so much so that she was thoroughly alarmed. Then followed a forcible tightening of the uterus. The active fetal movements persisted for



Fig. 2.—Vertex presentation. Left occipito-anterior position.

a minute or two and with the contraction of the uterus something slipped from under her ribs on the right side and she was instantly and permanently relieved from the pain which had persisted for several weeks.

On palpation I found the position of the baby as shown in Fig. 2. The head was at the brim of the pelvis. There had occurred a spontaneous change of poles from L.S.P. to L.O.P. The child weighed



seven and one-half pounds; there was no unusual amount of liquor amnii. The mother was a 5 para, aged forty. She was delivered twenty-four hours after the spontaneous version.

From the story told by the mother my inference is that the primary factors in the revolution of the child were the active fetal movements. It is probable that the baby effected the change of poles by pressing upon the right side of the uterus with its legs and as the body revolved from left to right the version was assisted by the contractions of the uterus, and gravity.

16TH AND HOWARD.

## Society Transactions

### AMERICAN GYNECOLOGICAL SOCIETY

#### FORTY-NINTH ANNUAL MEETING

HOT SPRINGS, VA., MAY 15, 16 and 17, 1924

(Continued from October)

DR. GEORGE GELLHORN, St. Louis, Mo., read a paper on **Milk Injections in Gynecology and Obstetrics**. (For original article see page 535.)

#### DISCUSSION

DR. JOSEPH BRETTAUER, NEW YORK.—I have had considerable experience with the somewhat similar method of treating these cases with vaccines, and have yet to see a case which beyond doubt was benefited by their use.

The case described by Dr. Gellhorn impresses me as a rather unfortunate selection. To my mind, a bulging abscess in the pelvis, where the process has been entirely limited and localized, should always remain for surgical interference.

DR. FRED L. ADAIR, MINNEAPOLIS, MINN.—I have been using foreign protein in the shape of whole blood subcutaneously for a good many years. I was led to do this first, I think, in newborn infants and then I applied it in some cases of pelvic infection, and certainly some cases have recovered where one might have expected only death.

Dr. W. P. Larson at the University of Minnesota, was led to do some experimental work with foreign proteins on rabbits, which were injected with sheep's blood. Three of six rabbits developed antibodies. These six rabbits were subsequently injected with typhoid vaccine and the three which had developed antibodies showed no particular increase in the antibodies; two showed definite increase and one that had no reaction following administration of the sheep's cells had the strongest serum of any. As a result of that, he has propounded a theory that seems reasonable, namely, that certain human organisms, and animal organisms as well, when infected produce antibodies and while some of them release antibodies to combat the infection, others may produce antibodies but they are not released. The foreign protein when injected serves as a stimulus to the cells to release these antibodies and permit them to combat the infection. This brings up the point, then, of the selection of the foreign protein which should be used, and the idea is that the foreign protein should be used which always produces antibodies and which does not produce shock. This places the treatment with foreign proteins on a little more understandable and scientific basis and I think if we are going to use foreign proteins we should use them on some scientific basis. Treatments have been largely empirical and certainly some cases seem to have recovered with this treatment which might have died had they not received it. I believe the treatment with foreign proteins is of definite value in certain cases of infection, especially the type known as septicemia.

DR. R. M. RAWLS, NEW YORK.—At the Woman's Hospital up to the present time I have used milk in about forty patients, including cases of salpingitis with masses extending well up from the cul-de-sac into the abdomen. Of these forty cases we can report on thirty-three from two to eleven months. None were suitable for abdominal operation and all were given in addition rest in bed, hot or cold treatment. In none did the smears give a positive gonococcus. Some of the cases might have been subjected to a posterior colpotomy, but since using the milk injections we have not found this necessary. In one case aspirated through the vagina, blood only was withdrawn and an ectopic was suspected. An exploratory laparotomy revealed a pelvic mass pushing the uterus forward and both tubes subacutely inflamed. Many loops of small intestine and the sigmoid were bound to the mass. Colpotomy was then done and a posterior drainage of gauze inserted although only old blood was evacuated. After a stormy convalescence patient was finally discharged at the end of 45 days. The interesting point is that seven months later she returned to the hospital with a pelvic mass more extensive than before and our diagnosis was again pelvic abscess and we used milk. After ten injections the mass was reduced to 3 cm. in size and at the end of ten months, when the patient was last seen, she was entirely relieved of symptoms and the pelvis was entirely negative.

In another case treated for double pyosalpinx who received seven milk injections, an ovarian cyst persisted with symptoms and abdominal section was performed. We found the tubes apparently normal, with a few fine adhesions, and an ovarian cyst. The cystic ovary and appendix were removed and now, nine months after operation, patient is four months' pregnant.

In two cases there was a hard indurated mass intimately attached to the pelvic bone suggesting a periosteal tumor. Both cases absolutely cleared up with milk injections. In our 33 cases, which have been followed from two to eleven months, we had 17 cases with complete recovery, or 51.5 per cent. Of these, 16 were acute. We had improvement in 12 cases, seven had acute symptoms. There was no improvement in four and of these three were chronic, and one evidently a tubercular salpingitis with peritonitis, and finally patient had a bladder involvement and died of septicemia. These figures are significant as it is the acute cases for which milk acts best and the chronic cases if they do improve have exacerbations. In our series we got decided chills, lasting from five to 30 minutes in 19 per cent. Fever was high in 21 per cent and constitutional symptoms,—headache, nausea, general malaise, the usual rule. We had an increase in leucocytosis ranging from 1,000 to 19,000. The height of the leucocytosis occurs after four or five injections. Sometimes after first injections there is a diminution in the white cells but an increase with later injections. We have found that usually the full benefit is received in about six injections with an interval of three days.

DR. COLLIN FOULKROD, PHILADELPHIA.—From the standpoint of obstetrics, I think I can recall to the minds of some of you that this subject is not entirely new, but I think Dr. Gellhorn's method may open up a new method that will prove of value in many cases of undetermined origin early in the course of the infection.

Some French observer ten or fifteen years ago said that he noticed if he had a patient with septic infection and she developed a breast abscess, she would almost always get well. He pursued that fact so far that he advised the production of an artificial breast abscess in order that he might control the puerperal infection. Possibly his claim was that it was from the breast abscess or the milk, whether the infection was staphylococcic or streptococcic, and that the antibodies were produced faster than they could be put in by serum. I think many of us will disagree with Dr. Brettauer in that we have never seen acute infection

in the puerperium controlled in a very short time by serum. We may say that we do not feel that the specific serum action is anything that is developed by the germ planted in that serum, but rather perhaps by the serum itself. This method, perfectly harmless in itself, if that be true, might be used in any case where a septic infection was developing.

DR. JOSEPH B. DE LEE, CHICAGO.—There was one point in the Doctor's paper that I would like to develop a bit further. I have found that if a breast abscess burrowed through the breast, involving different segments every week or so and resisting cure, if I would let one of those abscesses come to a head almost and then open it and run the finger around very thoroughly, rubbing the pus into the tissue, that the woman would have a chill and then rapidly the breast would be cured. I practiced that several times with success. It was a rather risky procedure but the results surely justified it.

Another point is that injecting a foreign protein into the muscle is safe, but injecting the same protein into the blood would cause anaphylactic shock. Just two weeks ago I learned by experience that this rule, applied to another remedy which the manufacturers claim never produces shock, is not true. A patient had hemorrhage after labor, and had purpuric spots on her arms. She was flowing more profusely than she should six days after the baby was born, and we gave her what we considered a harmless injection of hemoplastin which we had been using for over four years. We had used it for both mothers and babies, injected intramuscularly into the thigh, without any harmful effects whatever. She was given about 4 c.c. and in about five minutes she was dead. It was the most rapid case of anaphylactic shock that has ever come to my notice. Death might have been due to the loosening of a clot in her pelvis because two days before she died she had complained of a stitch in her side, shortness of breath, and we suspected then there might have been a clot. After death the history came out that this woman had been subject to asthma, the attacks being brought on by the mere proximity of a horse. The serum is said not to contain any of the anaphylactic producing bodies, that they had all been removed; the manufacturers have reiterated that statement many times. I would doubt the advisability of recommending its use without the strictest reservations.

DR. W. B. VOGT, ST. LOUIS.—Gynecology some years ago started in with being very conservative, because perhaps of the lack of knowledge of surgical skill, and then went over to the very radical operative treatment. And now again it is swinging over to the conservative, and I think that applies chiefly to conserving ovarian function in the young woman, and since these gonorrheal infections are mostly found in the young woman it behooves us to try anything that will conserve the generative function. I think, however, that conservatism can be carried much too far and I do not believe that Dr. Gellhorn himself would practice regularly the injections of milk in definite cases of pelvic abscess. I do not think that is a good surgical principle, and I believe all of us would rather incise a pelvic abscess. The milk injections which I have used after a good deal of thought did not impress me very much in the beginning as of great value, but I am seeing the value of this treatment more and more each day. In acute cases and the early subacute cases milk injections are of particular value. In the chronic cases, little or no result is obtained. In the infections about the cervix nothing can be accomplished as a rule, and this method must be combined with other methods of treatment, either local or general, as the indications may arise. I would be opposed to using the milk in such cases of pelvic infection where there was a definite pelvic abscess and I would rather be inclined to use the method we are all accustomed to, namely incising and draining.

DR. HERBERT M. LITTLE, MONTREAL, CANADA.—I have been using injections of milk for some time and think it is particularly valuable in acute cases. I know of at least one woman with definite salpingitis, pregnant after treatment with milk. I have also used turpentine within the abdominal cavity and found here, too, that there is the same immediate freedom from pain. The turpentine in paraffin was injected into the tubes, after the evacuation of their contents and the release of adhesions. In a number of cases where operation was inevitable, so-called "plaster of paris pelvis," the uterus was bisected and the appendages removed in the manner suggested by Dr. Kelly; and when drainage seemed indicated, I have used gauze wicks soaked in turpentine-paraffin. All these cases were characterized by absolute freedom from pain and smooth convalescence, the wicks were easy to remove and seemed to give better results than nonimpregnated gauze.

DR. G. GELLHORN (closing).—Dr. Brettauer very naturally questions the value of milk injections in culdesac abscesses where incision and drainage is so simple and satisfactory a procedure. I quite grant his argument and I am quite sure that there will be many cases where I, too, would incise and drain. This, however, is true, that after incision and drainage there always remain adhesions, scars, or other thickenings, whereas in the cases I report in my paper there was no vestige of previous inflammation noticeable. Do not think that I wish to recommend the milk injections as the one and only form of treatment in all inflammatory conditions. I feel as strongly as anyone in this room that the last word regarding the possibilities of protein therapy has not yet been spoken. In the meantime, let us go ahead hopefully, yet cautiously, and I should like very much to feel that after reading my paper you will admit that I have come forth with these claims only after a practical experience of almost three years and that at no time have I considered these injections a panacea or tried to do away with other satisfactory methods of treatment.

Dr. Anspach, who was to open the discussion, sent me a letter today in which Dr. R. W. Mohler, one of his associates, reports on the experiences at the Jefferson Hospital with milk injections. They treated twelve patients in all, seven of them with salpingitis, the rest more or less complicated cases. "All of these patients," says Anspach, "were given five or six injections of boiled milk, the largest dose being ten mls. There was a very marked improvement in the general condition of all; the pain became less, the weight increased, the appetite improved, and the anemia which was a marked feature in a few cases rapidly diminished."

None of the cases with marked anatomical lesions improved to such an extent that the lesions were not recognizable.

The conclusions we were able to draw from this small number of cases were, that milk injections relieve pelvic pain and tenderness, reduce the size of the pelvic mass, and improve the general condition of the patient. Most of them are more rapidly brought to a point where surgery may be undertaken with a minimum risk and there are a few patients who will need no further treatment.

DR. DEWITT B. CASLER, Baltimore, Md., read a paper entitled **Nephralgia with High Blood Pressure**. (For original article see page 569.)

#### DISCUSSION

DR. GUY L. HUNNER, BALTIMORE, MD.—I am sure we are all impressed from his description of this one individual case that it represents some form of nephritis, and with the end results of an interstitial nephritis, or a small, contracted kidney. The literature, as Dr. Casler has shown, mentions a good many different conditions



under the so-called nephralgic cases, among others those with hematuria. We know from Israel's work particularly that most cases of so-called essential hematuria have a background of nephritis, either localized or more or less general, and many of them have such evidences of a perirenal inflammation as thickening and contracture of the capsule.

My experience in kidney work convinces me that ureteral stricture is without doubt the greatest cause of nephralgia of any factor with which we have to deal. We find all types of kidney pain following stricture, from the dull backache to the most intense attacks of renal colic which we cannot differentiate at all from the attempted passage of an ureteral stone. The best evidence that ureteral stricture causes such attacks is that as soon as you open the stricture the attacks cease. It is the same way in the so-called essential hematuria cases: the best evidence that stricture is back of the kidney pathology which results in the hematuria is that the hematuria ceases after you give the kidney good drainage by ureteral dilatation. Even then some of these patients come back within six months or a year.

We have two gross types of kidney pathology following ureteral stricture: the type that develops a hydronephrosis, and the type which does not, and it is this latter type that represents the hypersensitive cases and they have the worst pain. They are the ones that give the most severe reactions after treatment; they are the ones that have the anuria symptoms; at times you have to wait twenty minutes or a half hour after passing the renal catheter before the kidney starts to function. The temporary anuria is often bilateral even after catheterizing only the one side. These are the cases that must often be treated for several years with ureteral dilatations. The strictures are more dense than in the hydronephrosis type. You can usually promise the patients with the hydronephrosis type that three or four treatments will suffice to make them comfortable.

The only criticism in my mind is, shall we call any of these cases essential nephralgia? Of course, nephralgia means nothing but kidney pain. The word essential or idiopathic is, when applied to anything, an admission of our ignorance of its cause. I think we must bear in mind the part that ureteral stricture plays in these cases. In the paper of Geraghty and Frontz they came to the conclusion that the diagnosis of idiopathic nephralgia "is arrived at by a process of elimination whereby the existence of all other possible factors, such as stone, hydronephrosis, ureteral stricture, infection, neoplasm, etc., can be ruled out with certainty." I think if we admit that idiopathic nephralgia is an entity we should be willing to abide by such a criterion. At the Brady Clinic the free passage of a plain catheter is regarded as evidence of the absence of stricture. By this method one overlooks at least two-thirds of all stricture cases. Again they fail to interpret slightly dilated ureters and pelvis as an indication of distinct pathology. The normal ureteral lumen is filled by a No. 8 or 9 Fr. catheter and one should not demand that the lumen be the size of one's little finger before recognizing that it is dilated.

If we are to accept the above criterion as to what shall be classified as idiopathic nephralgia let us use rational methods for the exclusion of the one lesion, ureteral stricture, which, I am convinced by abundant clinical experience, is the most frequent cause of kidney pain.

DR. CURTIS F. BURNAM, BALTIMORE, MD.—There is one other cause of pain in the kidney which I think ought to be looked into, and that is pain due to vertebral arthritis. It is merely a suggestion, but we see a good many patients with apparently ovarian pain or apparently renal pain where the real source is vertebral. Of course, this has all been studied, as Dr. Casler has said, but I feel that it is important to have an orthopedic examination, and also particularly nose, throat

and mouth examinations for sources of infection in any case of pain in the kidney.

DR. CASLER (closing).—Dr. Hunner saw this patient. The ureters were very carefully looked after. At first it was impossible to get a good sized catheter up the left ureter but after that was thoroughly dilated there was no trouble. We had hoped the ureteral stricture was the cause of the pain, but her pain was just as great after the dilatation. We did the decapsulation as a last resort.

DR. ROBERT L. DICKINSON, New York, N. Y., presented a paper entitled **The Need of a Clinical Study of Contraception**. (For original article see page 583.)

#### DISCUSSION

DR. N. SPROAT HEANEY, CHICAGO.—I can only endorse the need of such a clinical study as has been outlined. We all have occasions when we wish to advise contraceptives and it will require statistics to furnish us with safe recommendations.

DR. E. P. DAVIS, PHILADELPHIA.—I believe there is no successful method for preventing conception and when people ask me I tell them that fact. I state that abstinence is successful, but as it is unnatural it may lead to unhappiness. Then they ask what can be done. The cases divide themselves into two classes; first, the intelligent, educated persons of high moral principles. An example of that is a wife and husband, the husband a Professor in a University, the wife a former teacher, his second wife. There are children by the first wife and by the second wife. He has no hope of increase in salary, there are no reserve funds available, they have all the children they can educate and care for. The woman told me she had talked to her woman friends and what she had heard was disgusting and more or less indecent, and asked if I would sterilize her. I said, "With the consent of your husband and yourself I will do so." That illustrates the educated persons of the community who are at the present time in a very bad financial condition owing to small salaries paid by institutions and the increased cost of living.

The second group is much larger, the hospital cases where the man, even with the prosperity of the wage earner, may have reached the time of life or his physical condition may be such that he can earn no larger pay. The woman has been more or less damaged by childbirth and they are going to criminal abortionists. There the Social Service is called in to make a financial investigation of the family. The physical condition of the woman is next gone over and the question determined whether general anesthesia should be used or local by infiltration or nerve blocking. If the woman be pregnant she is told that she will be carried on, if she is in good physical condition, to the termination of that pregnancy but after that she will be sterilized by removal of the fallopian tubes and appendix as well.

In my experience sterilization has been in selected cases successful in moral and physical effects, in all that could be desired, and in that I have faith, which I have not in any of the methods I have heard of up to the present time. I have, however, great faith in Dr. Dickinson and the medical profession must meet the question fairly. We must take the matter into our hands and find whatever truth there may be in it, but it is a very broad question, an economic question, and in some respects a religious and racial question.

DR. CURTIS F. BURNAM, BALTIMORE, Md.—What is the legal status of a doctor who does a sterilizing operation for economic reasons, not for medical reasons? Suppose such patients afterward decided that they had made a mistake in having

such an operation done and sought redress in the courts? Can I have any information as to what the courts might decide under such circumstances?

DR. E. P. DAVIS.—I am informed by legal advice that the law governing such procedures requires, and it is our custom in the Jefferson Maternity Hospital, that the woman sign her written permission authorizing the surgeon to perform any obstetrical operation necessary for the life of her and her child; obtaining this on her admission we need not delay. When it comes to these special cases I am informed that the written request of husband and wife would hold.

DR. FRED L. ADAIR, MINNEAPOLIS, MINN.—In cases where it seems necessary to perform sterilization, does Dr. Dickinson prefer a major operation for salpingectomy or a vasectomy, which is relatively simple?

I have never found a husband who would submit to this; he prefers to have his wife submit to the major operation.

DR. HAROLD C. BAILEY, NEW YORK CITY.—I believe that Dr. Dickinson's paper is very timely. However, it seems to me that we should decide clearly before we consider this resolution, whether or not we have a right to interfere from a social or economic standpoint. In New York State among American born children the death rate equals the birth rate, and among the foreign born the death rate is just a little over one-half of the birth rate, and it strikes me that the type of people who are going to make use of this contraceptive information for social and economic reasons belong to the educated and higher class of society. I think we should definitely decide that we ought to consider this subject from the medical and physical aspect and not from the social and economic standpoint.

DR. C. H. DAVIS, MILWAUKEE, WIS.—During the past year I have checked up on each patient who has come to me in a pregnant condition and found that 10 per cent of a highly intelligent class of woman had become pregnant while using a contraceptive which they had believed for some years was keeping them from becoming pregnant. I think it is undoubtedly the case all over the country that these women who have had three children say, or four, do not voluntarily become pregnant. So far as we know at the present time there is no 100 per cent safe contraceptive unless one or the other of the parties is either sterile or potentially sterile. The sheath, I believe, if it does not leak, is undoubtedly the safest protection but I find that the husbands do not test the sheath before and after, and unless this is done there is no certainty. If they are instructed to test the sheath before and after, and then have the douche used in case of a small leak, the sheath is, I believe, the nearest perfect protection we have today, but there is certainly much need for study of the subject.

DR. DICKINSON (closing).—Most of the women who need sterilization are bad surgical risks, therefore I have tried to find some method that would work safely and simply. The use of the nasal electric wire electrode passed up to the cornua was the result of many years of using the cautery for obliterating cervix cysts and the like. My series of cases dates back to the time before we routinely did insufflation of the tubes. Since that time I have only had two patients on whom I felt justified in trying to close the tubes.

Like Dr. Adair, all the husbands I know of have refused operation, and when you come to that it is not quite fair to put it up to the man. Perhaps he has a tuberculous wife. He may marry again after her death; it is not fair to make him sterile.

I hope you gentleman will believe that this is not propaganda; this is a serious scientific attempt to get at the facts.

## NEW YORK OBSTETRICAL SOCIETY

MEETING OF MAY 13, 1924

THE PRESIDENT, DR. FRANKLIN A. DORMAN, IN THE CHAIR

DR. H. J. W. MORGENTHAUER presented, by invitation, a special  
**Enclosed Bed for the Care of Premature Infants.** (See page 622.)

DR. HENRY C. COWLES (by invitation) presented a paper entitled  
**The Occiput Posterior.** (For original article see page 616.)

### DISCUSSION

DR. PAUL T. HARPER, ALBANY, N. Y.—The most striking feature of Dr. Cowles' paper is the familiar attestation as to the frequency of posterior position of the occiput.

Our textbooks tell us that the occiput is usually found at the front; but there is little attention given to furnishing a logical basis upon which designations between primary and secondary anterior positions may be made. The statistics presented in Dr. Cragin's book, for instance, were compiled in some measure by members of the resident staff among a majority of whom, it is my personal belief, the essential tests of primary position were presence of fetal heart sounds to the left or to the right of the umbilicus and, again, direction in which external rotation took place. If the fetal heart was heard in the lower left quadrant, position was L. O. A. If the occiput rotated to the right after delivery, position was R. O. A. As far as many were concerned there was little attention paid to the question of whether external rotation took place through an arc of  $135^{\circ}$  or of only  $45^{\circ}$ . Statistics into which even a reasonably large number of superficial observations enter fall short of conviction as to the actual frequency of primarily posterior position of the occiput.

I am convinced a great many primary occiput posteriors are missed because the general principles upon which the diagnosis was made, namely presence of the fetal heart to the right or to the left of the umbilicus in front and notation of direction rather than extent of external rotation, are still quite generally applied.

Further, I am convinced that the primary position is posterior more than half the time. The most valid proof of this, to my mind, is offered by noting direction and extent of external rotation. If after delivery the head turns through an arc of  $135^{\circ}$ , evidence that the primary position was posterior is quite conclusive, unless one can prove that some very marked abnormality of shoulder mechanism explains the extent of rotation.

In all posterior positions there is an element of deflection which, in the R. O. P., invariably brings the fetal chest and therefore the fetal heart sounds toward the front and to the left of the umbilicus, and invites error in diagnosis.

Our students are taught that, before delivery, the most dependable sign of primary posterior position is referable to location of the fetal small parts. Feet and buttocks are at opposite ends of the front-to-back diameter through the podalic extremity of the fetal ovoid. If the small parts, the feet particularly, can be seen and palpated to the left and the front, it is apparent that the buttocks are to the right and the rear and, since the occiput is in line with the buttocks, that the primary position is occiput-posterior. If this is checked up by the observation that the head turns backward at delivery through an arc of  $135^{\circ}$ , positive diagnosis of primary posterior position of the occiput is made.

As a matter of fact it seems quite reasonable to presume that primary position should be posterior. Ballotement is a physiologic phenomenon we are all familiar with and it proves that the child is heavier than the fluid in which it is immersed. The mother spends at least five or six hours out of twenty-four in one position, namely lying on her right or left side. The pregnant patient rarely sleeps on her back. The inevitable thing for the child's back to do is to gravitate into a flank and, remaining there for fairly extended periods, it is not unnatural for the head to engage commonly occiput-to-the-rear. It is evident that maternal posture is a factor in assumption of primary posterior positions.

As to operative procedures, I believe there is a fallacy attendant upon conduct of the Scanzoni maneuver and one associated with practice of manual rotation of the occiput.

Dr. Cragin stressed the fact that, in practice of the Scanzoni maneuver, forceps-traction favored deflexion since forceps tips rested and therefore exerted tractile force toward front of the head. Deflexion is relative in every posterior position and, with practice of this procedure, it would seem that undesirable increase in deflexion was quite inevitable.

The fallacy of manual rotation rests in supposing that a head in persistent occiput-posterior position because of disproportion could be rotated anteriorly by a maneuver that increased working diameters of the particular head to the extent of the thickness of the fingers that grasped it.

Single-blade instrumental rotation is in my opinion the simplest and most successful method of artificial rotation. It brings about uneventful delivery in about nine out of ten cases. It is so simple that in our hospital, median forceps operations are done without bringing the patients even to the end of the table. The instrument is introduced with the operator standing at the patient's side and, using a single blade to rotate and to hold the occiput anteriorly while the second blade is being applied, advance is readily accomplished. The tip of the forceps blade is placed beneath the occiput, the latter is then raised bodily and rotated anteriorly. You supply an artificial pelvic floor and convert an R. O. P. into an R. O. A. or an L. O. P. into an L. O. A.

In high arrest of the presenting part, particularly when associated with incomplete dilatation of the cervix, it is a matter of personal experience that in efficiency, lack of trauma to maternal soft parts and freedom from fetal injury, internal podalic version and breech extraction are far superior to high forceps and not infrequently to high-medium forceps application.

DR. A. B. DAVIS.—I agree with Dr. Harper that there are many more cases of occiput posterior than are recorded in our histories.

There is one point Dr. Cowles brought up and that is the change in the character of our patients. I do not think it is a negligible quantity. We are certainly seeing a change in the Lying-In Hospital. In 1912 I read a paper on cesarean section, and in this discussion, a physician made the statement that he delivered many thousand cases and had not found it necessary to have cesarean operations done and he thought if there were not so many wonderful abdominal surgeons we would not hear so much about cesarean section. I think he was honest. I believe he came from a community where the pelvis are of ample size. The thing we are apt to leave out of the question is the relation of the child to the pelvis, whether one is fitted to the other.

In the Lying-In Hospital we are seeing fewer of the rachitic type of pelvis, which you can tell beforehand that they require cesarean section. But there is a type that is not noted so much—you may call it the male type of pelvis, or the funnel pelvis. The women are of moderate height, very short in stature, with very wide hips, but made up largely of cushions of fat. These women give birth to children with thick bones and big, square, block-like heads. In those



cases we are quite apt to get the posterior position and the membranes are apt to rupture either before labor begins or soon thereafter. These patients do not go into labor rapidly; they have pains, but it may be a day or two before we wake up to the fact that they really are in labor, and soon after that the mother is tired out and we begin to get signs of distress.

Pelvimetry, I believe, has been overdone. In these patients the external measurements are usually up to or above the standard requirements and yet we have trouble. The proportions between the mother and the child are not suitable. If we recognize these cases earlier much can be done by manual rotation at the brim early in labor.

Then, if we had enough self-control and the condition of the baby did not require immediate delivery, we could let the patient come out and see that that rotation was maintained to the anterior. The trouble with many of these posterior cases, speaking of the midpelvis position, is that most of them do not come to the midpelvis in that position.

DR. G. L. BRODHEAD.—I am very much interested in Dr. Cowles' high percentage of persistent occiput posterior positions. Dr. Cowles' statistics have been made up of work done in the last few years during which time there has been a pronounced tendency to interfere earlier in the second stage than was the case some years ago, when the textbook statistics were compiled. The earlier in the second stage that we interfere, the more likely are we to find the occiput posterior and this fact would make a very decided difference in the percentage of persistent occiput-posterior cases at the present time.

Considering the treatment of persistent occiput posterior positions, it seems to me that with the head above the brim, or high up in the pelvis, the majority of us would naturally select podalic version. If the head is in midpelvis, we would choose between podalic version and the use of forceps. With the head low in the pelvis the Scanzoni maneuver of rotation with the forceps, if properly done, is practically devoid of danger to the mother or the child.

One point Dr. Cowles brought out in his paper was the extraction of the head with the occiput posterior. I would not bring the occiput out posteriorly in a primipara, if I could rotate the head easily with forceps. In the multipara it may make very little difference.

DR. COWLES (closing).—I believe our difference of opinion is rather based upon personal preference as to a method of operative termination. I think Dr. Brodhead is right in the statement that statistics compiled now will show a higher percentage of posterior positions than those previously gotten together, because I am not so sure but that the number of posteriors is on the increase.

As to the question of whether you should, or should not, rotate at the outlet, I thought I made it clear that this suggestion applies only where there existed a markedly contracted outlet. In such, the trauma produced by rotation would be more definite to the child and to the perineal floor, and for this reason an indication where I believe the posterior should come through as posterior.

DR. EMERSON L. STONE, New Haven, Conn., (by invitation) presented a paper entitled **Contractions of the Pelvic Outlet Necessitating Cesarean Section**. (For original article see page 625.)

#### DISCUSSION

DR. F. W. RICE.—The point brought out in regard to the importance of measuring the outlet and not waiting until the patient is in labor before finding out just what the condition is, is of value.

Where there is deformity of the spine, and a kyphotic pelvis, with narrow arch, we may get an extreme, often 10 centimeter posterior sagittal. I have seen two of these cases where prenatal observations certainly indicated an absolute obstruction. Both were in labor at home a long time and it was only after admission to the hospital, that it became apparent what a deep posterior sagittal was present.

DR. HERBERT THOMS.—In the textbooks the normal transverse diameter is given as 11 cm. by some authors, and by Williams as  $10\frac{1}{2}$  cm. Those of us who have measured a good many outlets, have been impressed with the fact that even in normal cases the majority of the transverse diameters is less than this.

Some time ago with this in mind I studied 1,000 outlets of women who presented normal pelvis and the average transverse diameter was 9.5 cm., which ought to establish the fact (unless a greater number of cases is studied) that the normal transverse measurement is probably near that figure.

Dr. A. H. MORSE.—Dr. Stone has emphasized three points: the necessity of measuring accurately the diameters of the inferior strait in order to determine the character of the pelvic outlet; the importance of the length of the bituberal diameter in its relation to the length of the posterior sagittal, and the fact that not every patient with a contracted outlet will have a difficult delivery. With regard to the latter point, the statement sometimes made that patients in whom the bituberal diameter is 7 cm. or less must be delivered by cesarean section is not quite accurate, because the length of the posterior sagittal may compensate for the shortening of the transverse diameter.

We might have effected delivery in these patients following pubiotomy, as has been advised by Williams, but taking everything into consideration, delivery by cesarean section seemed the better method.

DR. H. HALSTEAD.—At Sloane we have taken into consideration not only the transverse and the posterior sagittal diameters, but in cesarean sections, have also noted a high symphysis, with a "poor inclination." This is a symphysis which, as the patient lies on her back, goes right straight up and down. We take that into consideration almost as much as we do the transverse and posterior sagittal diameters.

DR. JOSEPH BRETTAUER.—I have been simply struck by the frequency with which this condition was found in New Haven. The funnel pelvis was discussed over thirty years ago. I remember distinctly an authority expressing himself that it was a distinct skeletal racial difference; that it was found very frequently in certain Slavic races, that it was practically unknown among the Anglo-Saxons, in France and in England, and in Italy. So when I hear that it is present in 7 per cent of cases it is astonishing. There must be something about the public from which these cases are drawn to account for this. I mean that, to my mind, they must have some Slavic or possibly strictly Russian characteristics about them, not Jewish, for it happens very rarely in the Jews.

DR. H. C. WILLIAMSON.—Some years ago I wrote a paper on this subject and collected statistics right here in New York, in which the incidence was about 7 per cent.

DR. HERBERT THOMS.—For Dr. Brettauer's benefit, I would like to say that it may be of interest to note that Emmons, of Boston, went over 260 dry pelves of American Indian women at the Smithsonian Institute and there found the incidence of funnel pelves to be between 6 and 7 per cent.

DR. FRANKLIN A. DORMAN.—I should say that the frequency of the funnel pelvis is much greater than we have suspected, and if it comes down to the actual measurement of the bisischiatric diameter we are going to find it is 7 per cent and oftentimes more. In my experience, I think I have met more of them in the Jewish than in the other races.

DR. STONE (closing).—In answer to Dr. Brettauer's criticism, I believe that in many instances the minor degrees of funnel pelvis pass unrecognized, but I feel that with a more careful study of the pelvic outlet we shall find the incidence somewhat higher than has been realized.

The difficulty in measuring the posterior sagittal diameter has been mentioned and without the aid of a special instrument this may be the case. In this connection I can recommend the Thoms' pelvimeter which we have used for the past four years with a great deal of satisfaction. It is made by the Wilms Instrument Company of Baltimore.

I wish finally to emphasize that in our experience the length of the normal transverse diameter averages somewhat under the textbook figures of 10.5 to 11 cm. I have found many more patients with a transverse diameter of the outlet falling between 9 and 10 cm.

## BROOKLYN GYNECOLOGICAL SOCIETY

MEETING OF MAY 2, 1924

DR. FRANK A. PEMBERTON presented a paper entitled **Acquired Atresia of the Vagina and Cervix**. (For original article see page 605.)

### DISCUSSION

DR. GORDON GIBSON.—It certainly speaks well for that clinic where they can review their work for ten years and bring out such a large number of cases on this subject. I am sorry the essayist did not use the old term stenosis rather than partial atresia because so many of these cases are simply stenoses rather than atresias.

Certainly Dr. Pemberton's classification is a working one, and is one that perhaps we can all use. I like the idea of grouping them into premenopausal and postmenopausal conditions because the two are such entirely different things and their treatment is so entirely different, as the doctor emphasized.

I was in a way surprised that he classified so many of the premenopausal as postinflammatory. I think it is a pretty difficult thing to take a given case, where in the majority the history is, as he says, difficult to get—they are the poor, rather ignorant people—and say that this is due to inflammatory condition or to a pure congenital defect. Of course, it is true if you get a defect of the vagina you are apt to get a defect of the other parts of the genital tract, but it is possible to get a defect of the vagina without a defect of the uterus, tubes or ovaries or any of the genital tract.

I have not seen anywhere nearly the large number of cases that he has seen, but I have been largely inclined to believe that a good many of these things that we might think are due to infections are really congenital in origin.

The case of condylomata which he reported was very interesting to me because we had at the Long Island College Hospital recently a case of dyspareunia and an irritating vaginal discharge where the whole vagina was simply a mass of condylomata and also out on the vulva and for a considerable distance down the thighs. It was the worst looking thing I ever saw and the toughest proposition

to handle that we have come across for a long time. We obtained a very good result by the use of the actual cautery, at several sittings carefully and very superficially burning off these condylomata and keeping the vagina dilated so we would not get any constriction.

The other cases that we have seen have been, I think, more the result of faulty technic. I have in mind one case in particular of a patient who was operated on in a private sanitarium. This patient had had one baby and was torn and was sewed up. She went to three or four doctors and finally came into the hospital for dyspareunia; in fact, it was not a case of dyspareunia because there wasn't any intercourse because the whole vagina was a mass of scar tissue. I wrote to the doctor and asked him what he did and what the conditions were before and he said she had an extensive tear of the perineum, that he did a simple perineorrhaphy and that the patient went home well. That was the hardest case imaginable to handle. We operated on her three times before we got a vagina that would functionate. Whether she had an idiosyncrasy to vaginal operations or not I do not know, but, anyway, every time we operated on her it seemed as though we didn't get the results we hoped for and finally the only way we could do it was to split the vagina transversely and sew it up longitudinally and bring a flap of vagina down from the posterior vaginal wall, sew it to the introitus, and then used the glass plug that we don't see so much today. She wore that for a long time and we got a fairly good result finally.

Another thing which has fallen into disuse is the term adhesive vaginitis for the common everyday variety of senile vagina, which, as the doctor said, is simply an adhesion of the mucous membrane. The treatment of this condition is comparatively simple, but the term adhesive vaginitis really describes the condition better.

One of the most interesting cases that I ever saw along this line was a case of Dr. Grad's some years ago where a man did a curettage in the presence of an acute gonorrheal infection of the cervix, and in which he got an atresia of the cervix, as you would expect. I believe there are a good many of these cases of gonorrheal stenosis that are due to the fact that operations are done in the presence of infection, and I think we have seen quite a number of them recently where a certain operation is being done in the presence of an acute inflammatory process of the cervix. Certainly none of us have been able to achieve the plastic results of some of our predecessors where they took the patients, put them in the hospital, gave them douches and local treatments and relieved the local condition before any plastic surgery was done, and I believe the common cause of those disturbances, which the doctor so well described, is that we are doing operations at the present time in the presence of infection. I know our general surgical friends would not think of amputating a limb through an infected area and I do not see any reason why we should amputate or do any operation on the cervix through an infected area.

The treatment is not as easy as the doctor would lead one to believe. I believe we can sum it up in this way: The treatment means infinite patience; tell your patient it is going to take a long time, that you must in a case of atresia or stenosis of the cervix use careful dilatation and give the cervix a chance to grow a mucosa over that area. I believe there is nothing quite as good as weak solutions of silver nitrate in the treatment of these conditions. Strong solutions will cauterize but weak solutions stimulate the growth of the mucosa.

The last point that the doctor brought out was the treatment of atresias of the cervix. I think what he said is perfectly true, but I believe if any case has such a marked atresia of the cervix that that patient would be better off to have a hysterectomy and everything removed rather than try to play with a cervix which

has been so badly damaged. But stenosis of the cervix can be handled by careful dilatation and careful treatment in the office.

Certainly the number of cases that the doctor has brought out makes his paper authoritative and we must accept what he says.

In a way I am sorry he did not say more about the stenoses of the cervix which we are getting with radium. I believe they are becoming more and more common and believe until we learn more about the proper filtration and screening of radium we will get some rather difficult cases to take care of. Dr. Keene told me recently that all these atresias are not due to radium as they are to the way it is used, and that if it is properly screened and the alpha and beta rays are properly cut out, leaving only the gamma rays, we won't get these atresias.

I have had four cases of stenosis of the cervix recently. One of them was a real atresia and I know it was due to my own faulty technic because it was a case in which the radium was simply inserted into the cervix without rubber screen.

DR. GEORGE G. WARD.—I am particularly interested in this subject because the first paper I ever wrote, was on atresia of the vagina. I think that was in 1899. That paper was read before the Section of the Academy of Medicine in New York City—a case of atresia of the vagina, complicated by pregnancy. I was much concerned as to how she was going to deliver that baby with this diaphragm across the vagina, and I supposed we would have to do a cesarean section. However, in looking up the subject I found that in the majority of these cases the physiologic softening that takes place in the later months of pregnancy, which allows of such great dilatation of the vagina, also softens the atresia and allows of dilatation there, and in that particular case that is exactly what happened, and that was the reason why I wrote the paper.

I am interested in this subject from the point of view that Dr. Gibson just mentioned, namely, atresias resulting from radium. We are using radium quite extensively these days, and I have had the records in the Woman's Hospital looked up to see what cases we have had of atresia after its use. In some 700 cases in which we have used radium in the last few years, I found only 7 cases which had atresia, and in looking up those 7 cases we found 4 of them had the atresia independently of the radium; that is to say, they were cases of carcinoma of the cervix which had pyometra and obstruction before we used the radium. There were 3 cases which developed trouble subsequent to the application of the radium, but in one of these the cautery had been used in conjunction with the radium and how much the stenosis was due to the actual cautery and how much to the radium might be open to question.

My impression is very much as Dr. Gibson mentioned that we do not really need to fear atresia in these cases following the use of radium if it is properly used and properly screened. A good many have used radium without using the millimeter of brass or other metal, as well as the rubber, and perhaps it is due to the fact that we always use it in the Woman's Hospital Clinic that we may not have had so much trouble. We always have in mind the possibility of atresia following radiation in these cancer cases, and where we suspect it we pass a sound to see if the cavity is open. Only today it so happened that there was a case that had had radiation sometime ago and developed a temperature, and returned to the hospital and it was a question whether there might be a pyometra as the cause. I demonstrated that the canal was open and that there was no accumulation in the uterus.

As to atresia due to other causes, traumatism, for instance, Dr. Pemberton mentioned a case reported by Dr. Grad where strong nitric acid had been used in the vagina with the formation of dense scar tissue in the upper third, and I would like to speak of that case because of the very ingenious technic that Dr. Grad used in curing the condition and published in a recent number of the AMER-



ICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY. The atresia in this case was a nearly complete diaphragm across the upper third of the vagina. The method that Dr. Grad used consisted in cutting across the disc, catching hold of the cervix and pulling the cervix through the atresia and suturing the margins of the atresia to the cervix. The result was very satisfactory. Strangely enough only a week ago I had a similar case in my division in the Woman's Hospital and the technic I followed was identical to that used by Dr. Grad. My case was caused by rape when the patient was twelve years old. She is twenty years old now. There was a diaphragm across the upper third of the vagina with an extremely minute opening, through which one could pass a fine probe. At the time of the menstrual period the blood slowly dribbled through this opening, causing considerable discomfort and pain, and I was able to carry out the technic exactly as Dr. Grad described it.

A case of congenital atresia that comes to my mind, occurred about three years ago in a congenitally small vagina. The woman was in distress because her husband was going to leave her. Intercourse was not possible, and he was going to get a divorce. I succeeded in curing her by incising the vagina laterally and utilizing the labia minora on that side as an attached flap to fill in the gap, after unfolding it by dissection, thereby materially increasing the caliber of the vagina.

DR. EDWARD A. BULLARD.—This condition was very common in the old days. The various methods of treatment in those days frequently produced occlusions and atresias of the cervix, and even obliteration of the uterine cavity. At one time live steam was considered a very good thing to use in the interior of the uterus to stop stubborn hemorrhages or severe leucorrhæas, and there are many, many cases in the literature where live steam had been used by the process called atmocausis, and the entire endometrium was destroyed and the uterine cavity obliterated, or the cervix occluded and a hematometra developed. Pure nitric acid was quite a favorite many years ago, and its application frequently resulted in total occlusion of the cervix, destruction of the endometrium and total obliteration of the uterine cavity. Pure carbolic acid accomplished the same result, as also did the actual cautery. A condition which we are seeing very infrequently today, but which was common in the literature of thirty to sixty years ago as a producer of complete occlusion of the cervix or obliteration of the uterine cavity, was puerperal sepsis.

DR. WILLIAM H. CARY.—I heard no statement in the paper in reference to chronic vulvitis as an etiologic factor. Two of the most obstinate cases I have had to treat were in virgins in the fifth decade where there was a chronic vulvitis without vaginitis, of an ulcerating healing type which occurs at the introitus and is associated with some pain. They are not cases of definite kraurosis either. They are very obstinate and very difficult cases to take care of.

DR. PEMBERTON.—We also treat vaginitis with silver nitrate and we are inclined to use a 10 per cent solution the first time, to get the surface epithelium off, and we then use a weak solution after that. One method that we use for condylomata is that of fulguration. You can fulgurate as many as the patient can stand at a sitting and gradually clear them up. As to the etiology of what I call the inflammatory atresias, it is difficult to determine whether they are inflammatory or congenital. I suppose you can only find that out by following cases of vulvovaginitis to see if they develop stenosis.

I agree with Dr. Gibson that partial atresia would much better be called stenosis.

# Department of Reviews and Abstracts

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CONDUCTED BY HUGO EHRENFEST, M.D., ASSOCIATE EDITOR

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## Collective Review

### PELVIC VARICOSITIES—VARICOCELE PELVICA

BY JOHN OSBORN POLAK, M.D., F.A.C.S., AND  
GEORGE W. PHELAN, M.D., C.M., BROOKLYN, N. Y.

**T**UBOOVARIAN varicocele was first described as a clinical entity by Richet in 1860—and many of the older writers have written on its etiology, pathology and symptoms—but the younger gynecologists, particularly on this side of the Atlantic, barely mention its existence.

A careful review of the literature shows that there have been no American contributions to the study of this lesion since the classical paper of A. Palmer Dudley in 1888, except the recent efforts of Emge published in *Surgery, Gynecology and Obstetrics*; Kelsall's paper in *American Journal of Surgery*, 1920; and that of Darnall, presented before the American Medical Association in 1917.

For many years the reviewers have been interested in the significance of pelvic varicosities as a cause of pelvic distress in women, since clinical observation on the operating table has demonstrated that many of the pains referable to the pelvis, found in the long ptotic type women and in multiparae with an enlarged uterus, associated with pelvic displacement of long standing, are not due to inflammatory conditions but to changes in the venous circulation of the pelvis.

Fortunately this condition, which must be admitted as a morbid entity, and which can be clearly defined from the anatomic point of view, may appear independent of any ovarian or tubal lesion. Yet it produces a symptomatology very similar to that of adnexal disease, and in time produces a definite pathology in the ovaries and pelvic tissues.

#### ETIOLOGY

The pelvic veins are specially predisposed to overdistension for the reason that they are without valves and are not supported by either muscle, fascia or integument and are under constant gravity pressure while the woman is in the erect position (Skene).

Richet, as early as 1860, stated that the uteroovarian plexus in little girls who had never menstruated was but slightly developed, but after menstruation was established or the woman had borne children, the size of the plexuses became markedly increased. That pregnancy tends to produce varicosities is borne out by the fact that phlebectasia occurs in 75 per cent of all pregnancies and may be found distributed in the legs, the anus, the extremities and vulva. This proves the marked effect of pregnancy on the woman's venous circulation.

When it is remembered that there are four plexuses of veins, namely the vaginal, the vesical, the uterine and the hemorrhoidal, which drain into the inferior hypogastric, the parovarian or the pampiniform plexus which in turn empty through the ovarian veins into the vena-cava on the right side, and into the renal vein on the left; and that there is only one valve to control the entire back flow on these vessels, and that this valve lies at the end of the right ovarian vein; one can readily appreciate the pressure to which these vessels are exposed with a woman in the erect posture.

The venous plexuses lying in the upper part of the broad ligament, the one above and the other below the hilus of the ovary making up the pampiniform plexus, are supported by nothing but loose cellular tissue, having very little padding to rest upon; and where this plexus empties into the ovarian vein, the supporting tissues are even of poorer quality. The ovarian vein with these plexuses may be compared to a hammock slung between the pelvic brim and the movable uterus, with but one fixed point at the outer end of the ovarian vein. Hence, one can readily see that any descent or displacement of the uterus which will lower the uterine end of the hammock, will increase the blood pressure within these upper pelvic veins. On the other hand, the veins at the base of the parametrium have strong support from a mass of dense connective tissue mixed with smooth muscle fibers making up the uteropelvic ligaments.

While it is generally conceded that the mechanical factors in the pelvis increase the blood pressure and result in varicosities, Cornil contends that there is primarily a chronic inflammation of the vascular wall which has several stages—first, a vascular dilatation with a marked cellular new growth of connective tissue combined with a cellular infiltration and disturbance of the elastic fibers. This subsides in the second stage and leaves the newly formed connective tissue, which shrinks and becomes fibrous and is poor in nuclei, while the regeneration of the elastic tissue goes on. A vessel so diseased cannot withstand even the normal pressure of the column of the blood and consequently sacculates with the patient in the upright position.

It can, therefore, be deduced that, notwithstanding the statement of DeValz "that one is born varicosed," the condition is not congenital, but the result of the anatomic factors in the arrangement of the pelvic veins, due to the absence of valves, and the chronic inflammatory change in the vessel wall which leaves the vessel less resistant to the effect of repeated congestion and continued stasis resulting from menstruation, child-bearing and the continued upright position of the woman throughout life. Kelsall, like the writers, thinks that this condition is more common than is generally supposed, and attributes it to two causes: (a) general, and (b) local.

Under the first head, he mentions subinvolution of the uterus and of the ovarian vessels; too early and too much physical activity following labor, at which time there is a relaxed condition of the tissues and an unhealthy state of the vessel walls. This is probably occasioned by subinvolution or arrest of normal involution, and finally because the pelvic veins contain no valves.

Under local causes, he mentions habitual constipation and malposition of the uterus.

All observers agree that the left plexus is more frequently involved than the right, owing to the anatomic arrangement and the length

of the left ovarian vein and the fact that it drains behind the ilio pelvic colon; and furthermore, that infections of the left parametrium, arising from injuries to the cervix, are more common than on the right side.

Skene, years ago, called attention to this condition and stated that it occurred more frequently in midlife. He had never seen a case of pelvic varicocele in a woman under 25 years or over 60. This fact suggests that menstruation and childbearing must be considered the principal etiologic factors.

Our own observations have shown that many of the thickenings and increased tensions which we find in the pelvis on the examining table, and which elicit exquisite sensitiveness on bimanual palpation in the fornices, entered in our records as "pelvic cellulitis," vanish after death or on the operating table. On inspection all the pathology that can be found is shown in the enlargement of the veins in the pampiniform plexus. When one realizes that during pregnancy all of the pelvic veins but more particularly those on the left side, owing to uterine torsion, become excessively enlarged and that the veins in the upper portions of the broad ligaments are unsupported and because of their lack of valves become blood sinuses, it is easy to conceive how immediately after delivery—due to the retraction and contraction of the uterus—this efferent venous circulation becomes suddenly obstructed and the vessels overdistended and permanently dilated.

This is more evident after twin pregnancy or hydramnios on account of the excessive elongation of the uterine vessels. Furthermore, any interference with proper involution of the uterus, descensus or displacement must disturb the circulatory equilibrium in the pelvis to a still greater extent and result in venous stasis because of the unsupported veins in the loose tissues of the broad ligament.

In parametritis or pelvic cellulitis, which is one of the most common forms of pelvic infection, Nature produces a protective exudate by inducing a venous hyperemia. This leads to a transudation of serum, a diapedesis of red cells, a migration of leucocytes and a proliferation of connective tissue cells within the peritoneal folds of the broad ligament; and as organization of the exudate takes place, the scar tissue contracts and interferes with the venous outflow. This in turn results in varicosities.

In opening the abdomen of patients with a history of previous parametrial inflammation, immense venous enlargement is a constant finding and explains the premenstrual pain that these women complain of.

Twin pregnancy or hydramnios with the consequent slow and imperfect involution and with relaxation of the uterine and pelvic tissues, leaves the pelvis sore from engorgement of the intraligamentous veins.

Dudley, in his admirable paper published over 35 years ago, sums up the etiology and pathology by dividing the causes: (1) into those that are constitutional; (2) and those that are mechanical.

Under the constitutional causes he mentions (a) arrest of involution of the uterine and ovarian vessels which keep up the pelvic engorgement long after delivery, acting in conjunction (b) with the relaxed condition of the pelvic tissues resulting from muscle and fascial injuries; together (c) with the low state of the general health;

and finally (d) an unhealthy condition of the vessel walls, due to inflammatory changes and the absence of valves in the pelvic veins, all of which allow an increase in the blood pressure from gravity, when the woman resumes the erect posture.

While among the mechanical factors which predispose to varicose formation, he calls attention to (a) the anatomic relation of the veins themselves; the left vein being more frequently involved, due to the fact that it empties into the left renal vein at a right angle; (b) the length of the ovarian vessels, which allows a greater column of blood to distend them; (c) habitual constipation with hemorrhoidal stasis; (d) and the effect of uterine displacement.

These mechanical causes are all aggravated, in the ptotic type woman or in the woman with a pendulous abdomen, by the change in the intraabdominal pressure which follows the abdominal distension of pregnancy, and increases the pelvic engorgement.

#### PATHOLOGY

The first clinical effect of this engorgement is to cause pressure on all of the pelvic tissues and nerves, giving rise to a dull, aching pain and pelvic tenesmus. Later this disarrangement of the pelvic circulation produces actual pathology in the uterus, parametrium, ovaries, rectum and bladder.

Microscopically, there is a striking increase in the vascularity of the ovaries and parametrial tissues. Congestion and edema of the ovaries are constantly observed. This leads, as time goes on, to an increase in the fibrous tissue of the stroma with cystic changes in the follicles, interfering with their function. The endometrium is also edematous and hyperplastic, and there is a hypertrophy of the mucous membranes of the uterus and portio, while the vaginal mucosa becomes turgid and is of a purplish hue. The uterus itself, necessarily participates in this engorgement with resulting tissue change.

With this understanding of the etiology and pathology, there is no difficulty in developing the symptomatology and physical signs.

#### SYMPTOMATOLOGY

The history is always significant. These patients either have been the subjects of repeated pregnancies, a twin pregnancy, a hydramnios, prolonged labor, or had an infection of the parametrial tissues following labor, and date their symptoms from this time.

They complain of pelvic fullness and dull, aching pain, most often referred down the left side, or radiating from the kidney, for two to three days before the onset of menstruation. Some menstrual disturbance and leucorrhea are nearly always present. All symptoms are relieved or disappear when the patient assumes the recumbent position, especially with the foot of the bed elevated, but are increased by walking or standing.

Gradually the premenstrual and menstrual aching prolongs itself into the intermenstrual periods until the gnawing pain is practically continuous except when the patient is lying down. The four main symptoms are:

(1) Dysmenorrhea occurring as premenstrual pain of a dull aching character. This pain may be either unilateral or bilateral, but always grows worse on standing or walking, and just before menstruation,



but is relieved by lying down and with the appearance of the menstrual flow.

(2) Disturbances of menstruation owing to the endometrial hypertrophy resulting from the venous stasis. The menstruation is usually increased in quantity and prolonged in duration.

(3) Dyspareunia is often the symptom most complained of and this is probably due to the periphlebitis which involves the pelvic nerves, leaving them sensitive to motion and further pressure, from the increased congestion.

(4) A constant thin, watery vaginal discharge is frequently present. This results from the increased glandular changes of the endometrium. The pelvic pain may be increased after a movement of the bowels or after taking an enema, for a full rectum seems to support the varicosities and give the patient more comfort than when the colon and lower bowel are empty.

#### PHYSICAL SIGNS

There is a bluish hue to vagina and cervix, owing to the venous injection of the cervix and upper part of the vagina, which is frequently associated with varicosities of the vulva and thighs, when the patient is standing. On bimanual palpation the uterus and pelvic tissues are sensitive and there is an impression of tenderness in the fornices.

The uterus may be in normal position, low or retroverted, and is often somewhat enlarged, tender and sensitive to motion, with no apparent involvement of the adnexa.

Rectoabdominal examination of these patients in the erect posture, (after standing some minutes with the legs spread apart) will give positive evidence of varicose tumors in the broad ligament. On having the patient then assume the recumbent posture with the hips elevated, these tumors will disappear, only the vessel sensitiveness will remain.

#### PROGNOSIS

Varicose blood vessels in the pelvis, as in venous dilatations in other locations, are subject to the formation of thrombi, and owing to the deposition of calcium-salts in these clots eventually lead to the formation of phleboliths, which often are mistaken in x-ray pictures for ureteral stones. Also the large size of the vessels and the extreme thinning of the vessel wall may predispose to rupture. This is made more possible where there has been a history of inflammatory changes in the vessel. Then excessive muscular strain or trauma may become the exciting cause.

A sufficient number of authentic cases of rupture of a pelvic varix have been reported to justify us in thinking of it as a possible cause in the presence of an abdominal calamity in women, particularly after severe straining efforts. When the rupture is into the broad ligament a hematoma is formed, but it may so overdilate the ligament as to rerupture and form a hematocele with serious symptoms, and even cause death. Fleishman, Leclere, Olliver, DePaul, Honig and Delbert have reported such cases.

The disease is always progressive unless recognized early and proper treatment instituted. Palliative measures immediately after confinement, such as the repair of injuries, correction of displacement, etc.,

will do much toward minimizing the effects of pelvic stasis and the associated venous dilatations.

#### TREATMENT

As the recognized causes of this condition are pregnancy, uterine displacements, multiparity, pelvic inflammation and colonic stasis, all of which tend to increase pelvic congestion in the normal woman, and which become exaggerated in the presence of ptosis or pendulosity, our therapeutic measures must be directed to the correction of these lesions by such methods as will tend to reduce the pelvic engorgement and reestablish an equilibrium in the pelvic circulation.

#### POSTURAL MEASURES

Presupposing that birth injuries have been properly repaired, involution of the uterus and of the pelvic tissues, including the veins, should be stimulated by routine postural measures during the period of uterine involution. This does not mean for the ten days or two weeks, during which time the patient is confined in bed, but for the ten to twelve weeks necessary to complete pelvic involution. These postural measures should be begun immediately following delivery and include the Fowler position, with an ice-bag over the fundus, to stimulate uterine contractions. Have the patient lie upon her abdomen for periods of two or three hours, twice a day, in order that the lochial discharge, which has been accumulated in the vagina, may escape. After the uterus is firmly contracted and the red lochia have diminished, abdominal exercises combined with deep breathing exercises, with the patient lying prone with a firm pillow under her back producing lordosis, should be encouraged and used for periods of half an hour twice a day. After the sixth day, prolonged periods in the knee-chest position will empty the pelvic vessels and aid in massaging the ligaments, besides tending to correct malpositions.

After the patient is allowed to leave bed, she should assume the knee-chest position for five or ten minutes on returning to bed, and night and morning practice the "Monkey-trot" or "Mule-kick" to empty her pelvic vessels, and reposit her displaced pelvic contents.

#### MEDICINALLY

Certain drugs are supposed to have an effect on the pelvic circulation. These include: ergot, hydrastis, thyroid and pituitary extract, all of which have their advocates.

Our personal experience has shown that in the early days of the puerperium the routine employment of ergot preparations stimulates the contraction and retraction of the uterus; that hydrastis seems to improve the general pelvic circulation, while in the later weeks small doses of thyroid combined with pituitary extract have a beneficial effect on the pelvic tissues.

#### MECHANICAL METHODS

The mechanical methods consist in the reposition and retention of the uterus in its normal plane of equilibrium, supported by a properly fitted pessary. Nothing in our hands has been so effectual as having postpartum patients wear a pessary until lactation atrophy is well established. This does not imply that every postpartum pa-

tient should wear a pessary, but it does mean that every puerperal case should have the uterus repositioned and secured by a pessary if malposition exists. Furthermore, in all cases of subinvolution a pessary relieves the pelvic drag, favors proper circulation and improves the involution.

Practice has shown us that, prior to employing mechanical means for retention of the pelvic contents in their proper plane, depletive measures relieve the pelvic congestion and make the condition more amenable to mechanical support. By these we mean aspiration of the uterus with Bier-cups, with the patient in the knee-chest position, and supplementing this with the vaginal tampon moistened with a boro-glyceride solution. One important technical detail should be mentioned, and that is, that the patient should be instructed to return to the office with the tampon in position and be placed in the knee-chest position for its removal.

By following this suggestion the great gain that is made in emptying the pelvic circulation is maintained, and the vessels, because of the elastic support and because of the hygroscopic action of the glycerine, do not refill and dilate before their tone has been improved.

#### SURGICAL MEASURES

Of the surgical measures that have been suggested for the cure of pelvic varicosities, but three need mention and comment. The simplest is uterine suspension by one of the methods that have been suggested to antevert and elevate the uterus. This, of course, excludes procedures which interfere with the venous circulation, such as the methods of Coffey, Webster, and the complicated procedures of Mann and his school. Probably the most effective form of suspension, is the Alexander operation, or the Olshausen as modified by Graves.

Ligation and resection of the pelvic veins has theoretically offered a cure, but unfortunately the immense sacculation that frequently takes place in the veins of the pampiniform plexus demands extensive dissection, and leaves a pathology which is not free from pain at the menstrual period.

In our experience simple ligation and resection of the ovarian vein has not given the relief claimed for it. Hysterectomy for this condition should include the removal of the ovaries, if we expect relief from the periodic pelvic congestion. Only by an extensive removal of the parametrial tissues can we hope by hysterectomy to effect a cure—and at once, we ask, is such an extensive extirpation justifiable in the presence of this lesion?

A careful review of this subject has brought out the following facts: (1) That pelvic varicosities in women are not uncommon during sexual maturity; (2) that repeated childbearing is a predisposing cause; (3) that the anatomic construction of the pelvic circulation favors venous stasis, and that subinvolution and uterine displacement increase this engorgement; (4) that varicosities may exist without any other pelvic pathology and occasion a train of symptoms, not unlike those of chronic pelvic inflammation, except that there is an absence of temperature and leucocytosis; (5) that rest in the recumbent position with the foot of the bed elevated, always relieves pelvic pain; (6) that continued pelvic engorgement leads to permanent pelvic pathology in the uterus, parametrium and ovaries; (7) that the treatment should be primarily preventive, i.e., proper care during the puerperium, includ-

ing repair of obstetric injuries, postural methods, pelvic depletion by local treatment, and correction of malpositions with pessaries, etc.; and (8) that the operative measures, such as suspension, ligation and resection, or hysterectomy are last resort procedures and do not always give the promised relief.

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## Selected Abstracts

### General Gynecology

**Winter: War and After War Casualties Among Women.** Deutsche Medizinische Wochenschrift, 1922, xlviii, 64.

That the female population is adversely affected by war and its consequences as well as the male, is shown by Winter in this study. His figures cover the population of East Prussia, but he feels that they do not differ widely from those of other parts of Germany.

While there was an acute drop in the birthrate with the onset of war which remained low until its close, it rose as abruptly after the Armistice as it had fallen. It would now be back to normal if it were not for the increase in the number of abortions. Criminal abortions had been on the increase in Germany even before the war, but owing to the lax moral conditions prevailing since the revolution, they have increased in alarming proportions. Puerperal fever, which remained practically constant during the war, has increased markedly since the armistice, so that 18 cases occurred per 10,000 births in 1920 as against 9.2 in 1917. Winter attributes this to poor economical conditions as well as to the general lack of order which permeates all Germany. The number of stillborn infants has remained practically the same.

In common with other observers, Winter noted a marked increase in the cases of amenorrhea. This is ascribed to psychic influences, poor food and hard work. Strangely enough, this condition began to decrease rapidly as early as the middle of 1917 and has fallen steadily since. The number of cases of prolapse has also shown a marked increase, due mainly to hard work. Of considerable importance is the changed ratio of inoperable to operable carcinoma. While in 1913 the percentage of inoperability was 46, it rose to nearly 78 in 1919. This is due to the general apathy engendered by the war and its consequences. The number of gonorrheal infections in women is about seven times that which it was before the

war, while the number of luetic infections has at least been doubled. The point which Winter especially emphasizes is, that these conditions not only affect the period of hostilities, but extend for a long time after the conclusion of peace.

R. E. WOBUS.

**Mayer, A.: The Relationship of Obstetrics and Gynecology to the War.** *Medizinische Klinik*, 1922, xviii, 749, 787 and 820.

Mayer does not believe that the incidence of "war amenorrhea," was as great as many people believed. Numerous reasons were given for the occurrence of the amenorrhea, such as psychic influences, increased physical activity, undernourishment, both quantitative and qualitative, and sexual abstinence. The author, however, does not have much faith in these supposed factors. While most writers claimed that a secondary atrophy of the uterus was the anatomical substratum, Mayer believes the etiology to be a primary hypoplasia. Some authors maintained that conception was more favorable during the war, but the essential result was a diminution in fertility because the men were away. Noteworthy was the increase in the number of patients who complained of sterility after the war. In most of these women no cause could be found, although uterine hypoplasia was present in 20-25 per cent.

The percentage of unmarried mothers during the war rose from 8.6 per cent to 12.2 per cent. On the other hand, there was also an increased incidence of pregnancy in women who had had six and seven children. It was found that an increased number of gestations occurred especially in elderly primiparae and in elderly multiparae.

While many believed that more boys were born than girls during the war, the author could not substantiate this. Some authors even maintained that more girls were born than boys.

A study of the conceptions occurring during furloughs indicated that the optimum time for conception is during the first 14 days after menstruation. According to Siegel one may choose the sex of the child by selecting the time of conception in the menstrual cycle. The claim that pregnancy was prolonged during the war has not been proved.

Before the war there were 300,000 to 500,000 abortions yearly; but since the war the number has increased markedly. The increase in spontaneous abortions was due to difficult manual work, the stress of war, undernourishment and increase in venereal disease. The increase in the number of criminal abortions was astounding but there was also a large number of therapeutic abortions.

During the war there was a very appreciable decrease in the incidence of eclampsia. This was attributed to the diminution in the amount of fat and protein consumed, but disturbed nutrition does not explain everything. Mayer believes that enforced sexual temperance played a rôle and that eclampsia may perhaps be the expression of a sperm poisoning. He cites a few physical changes indicating sperm absorption even when conception does not take place. The increased incidence of eclampsia in primiparas is due to more frequent cohabitations early in married life and also to the fact that where the vaginal orifice is intact, there is a longer period of retention of sperm and therefore more time for absorption.

It was shown that during the war the general average weight of the children was slightly less than normal. There was also an increased incidence of spasmodophilia in the newborn, and in general the children did not thrive so well. The latter was probably due to the low temperature caused by the lack of coal. Despite all, there was not a very appreciable diminution in the ability of women to nurse



their babies, certainly not during the first 14 days. Of interest was the fact that the mortality of nurslings fell during the war.

During the war there were more spontaneous births and fewer operative deliveries than formerly. Furthermore complete lacerations and bladder fistulas almost disappeared. These facts may be attributed to the absence of physicians and hence to less premature interference with the processes of labor. The number of operative deliveries in the clinics, however, increased during the war and this is due to the increased frequency of premature rupture of the membranes and primary atony of the uterus. There was also noticed an increase in the duration of labor.

There was a definite increase in puerperal sepsis due to the inferior quality of the disinfectants used and also to the fact that the physicians who did obstetrics had to look, at the same time after soldiers with infected wounds. The infants born during the war showed an increase in the number of infections also.

There was a definite increase in the incidence of hypoplasia of the genitalia, due to a disturbance in the internal secretions of the ovary. There was also an increase in the occurrence of hernia and prolapsus uteri. Whether the frequency of carcinoma of the uterus was increased is debatable; but there was a definite increase in the number of inoperable cases. As regards myomata uteri it was found that there was a preponderance of soft myomata over firm ones, probably due to a deficiency of calcium in the diet. It was found that where lumbar anesthesia was used there were many marked reactions. The increase in gonorrhea was most pronounced but there was not a larger number of extrauterine pregnancies in consequence of this.

J. P. GREENHILL.

**Sanders: Death in Married and Unmarried Women in the Middle Period of Life.**

*Nederlandsch Tijdschrift voor Geneeskunde*, 1922, ii, 1782.

Sanders analyzed the deaths among women in Rotterdam from 1913 to 1921 inclusive. He found that the death rate among married women from 20 to 49 years is considerably higher than for unmarried women of the same period of life. Of the former, the annual death rate per 100,000 was 565 as against 497.7 among the latter.

The death rate from contagious and infectious diseases was less in married women, excepting that deaths due to influenza and pneumonia were much more common. The greatest difference in favor of married women was in the death rate from all forms of tuberculosis, which Sanders attributes to the fact that tuberculous women are not apt to marry. The same applies to a less degree to organic heart disease. The only other causes of death in which married women have a slight advantage are suicide and external violence.

Death from childbed fever, quite naturally, is almost 8 times as frequent in married women. It is not so apparent why the next greatest difference should be in death from unknown causes. Death from nephritis is twice as frequent in married women. Death from cancer is  $2\frac{1}{2}$  times as frequent in married women and, strangely enough, the least difference is shown in cancer of the breast, the number being 5.7 and 10.9 per 100,000 respectively. Strangely enough, the preponderance of cancer in married women is about as great in the extragenital organs as it is in the genital organs, though the actual number is considerably greater in the former.

R. E. WOBUS.

**Walthard, M.: Gynecology and Allied Disorders.** *Schweizerische Medizinische Wochenschrift*, 1922, lii, 217.

Old ideas in which all ailments of the so-called "female disorders" are charged to the uterus are reviewed. The writer discusses the various phenomena connected with menstrual cycles and with pregnancy, such as nervous disturbances, an in-

crease in the carbon dioxide tension just before menstrual flow is established and so on. There may be however outside disturbances which have a bearing on the action of the ovaries and their allied organs, as e. g., tuberculosis, or Basedow's disease. In conclusion he argues that we must not attribute all female trouble directly to the internal genitalia but must at the same time carefully eliminate any other possible disturbance elsewhere in the body. A. C. WILLIAMSON.

**Culbertson: The Relationship of Women's Diseases to the Chronic Patient.** Wisconsin Medical Journal, 1923, xxii, 59.

The author discusses his subject under six headings: (1) The physiologic disturbances; (2) Ectopic pregnancy; (3) New growths; (4) Mechanical defects; (5) Sterility, and (6) Pelvic inflammations.

Backache is probably the most frequent complaint we have to deal with and yet its cause is found more often elsewhere than in the pelvic organs. The distress due to general abdominal ptosis is extremely common and this fact should be learned early in his experience by every physician. Colitis is a more frequent cause of left-sided pain than is the left ovary and the same holds true for the appendix in relation to the right ovary. Also "neurosis" finds basis for its origin less in the uterus and ovaries than in the upper abdomen or in general systemic fault.

F. J. SOUBA.

**Haendly, P.: The Causes of Backache in Women.** Monatsschrift für Geburtshilfe und Gynäkologie, 1923, lxii, 97.

Out of 500 women who came to Haendly for various ailments 128 (25 per cent) suffered from backache. Of these, 81 had enteroptosis, 20 had pelvic inflammations, 15 had retroflexio uteri, 4 had sciatica, 4 were pregnant and 4 had myomata uteri.

Only 34 out of the 81 women with enteroptosis had normal pelvic organs; hence in these cases the sole cause of the backache was the enteroptosis. Of the remainder, 28 had retroflexed uteri.

Not all women with changes in the internal genitalia have backache as evidenced by the fact that of 113 women with retroflexion, prolapse, inflammation, tumors, etc., only 39 had backache. The author believes that enteroptosis was the cause of backache in 60 per cent of his cases. In the remainder the causes were inflammation, anomalies in position of the uterus and vagina, sciatica, pregnancy and tumors. The backache in the patients with enteroptosis is due to fatigue of the muscles, while the backache which is due to changes in the genitalia may be attributed to stimulation of the vegetative nervous system. In patients with both enteroptosis and changes in the pelvic organs, the real cause can be determined from the anamnesis and the examination. If the cause is enteroptosis, pain will be produced when the abdominal wall is first elevated and then permitted to fall suddenly. In these cases a properly fitted belt should be tried before resorting to operation.

J. P. GREENHILL.

**Mott, F. W.: The Reproductive Organs in Relation to Mental Disorders.** British Medical Journal, 1922, No. 3195, p. 463.

The author considers the inborn characters of mind. He thinks that a tendency to depart from a well-balanced mind is largely a matter of inheritance. He enumerates three facts in relation to the causation of mental diseases: (1) The importance of a neuropathic and psychopathic heredity; (2) The special liability of the neuroses and psychoses to occur in adolescence and the involutive periods

of both the male and female sexes, when the sexual function matures and wanes; (3) The influence of childbearing and lactation in women.

The author quotes certain statistical data relating to inheritance and insanity in the periods of adolescence and involution. There are two schools of thought in relation to dementia precox: the psychogenic and the physiogenic.

F. L. ADAIR.

**Donald, Archibald, and Buzzard, E. F.: The Neurasthenic Element in Midwifery and Gynecology.** British Medical Journal, 1921, No. 3174, p. 699.

Functional disorders are especially apt to occur during puberty, during menstruation, during pregnancy and parturition, and at the menopause. The following subjective symptoms are discussed: (1) Pain, backache, iliac, and menstrual; (2) Fatigue. This may be due to digestive troubles or is purely a nervous symptom. Some cases are due to a sort of toxemia attended by grave constitutional symptoms; (3) Tenderness. As objective symptoms are mentioned: Bladder trouble with incontinence, retention, or frequency; irritation with itching, burning and definite skin lesions; amenorrhea; phantom tumor and enteroptosis. Any treatment should be avoided which is apt to aggravate new tendencies. One should be very guarded in prognosis and reluctant to operate in cases with a neurotic element.

The gynecologist should satisfy himself as to the presence or absence of structural defects. It is imperative that one be familiar with the symptoms of neurasthenia, with a knowledge of its underlying causes. One must consider the inherent factor of individual differences. Fatigue is an important factor in the production of neurasthenic symptoms. They are especially apt to develop between the ages of 35 and 45. This is the period of particular stress in a woman's life. Fear of disease is an important factor in developing neurasthenia in many women.

F. L. ADAIR.

**Moll, A.: So-Called Sexual Anesthesia of Women.** Medizinische Klinik, 1923, xix, 675, and 716.

Normally mild stimulation of the erogenous zones arouses sexual impulses. In women, the essential erogenous zones are the nipples, the neck, the clitoris, the labia minora and also the vaginal mucosa; but the last only in those who have had sexual intercourse. Such stimulation produces turgescence of the genitalia but this may also be produced psychically. Ejaculation, however, requires a different stimulus. The latter must be strong and it must be rhythmic and produced essentially by rubbing.

Women may have libido but no orgasm and, on the other hand, women may have orgasm without libido; but orgasms are commoner in those who have sexual desire. There are also many women who have no orgasm during sexual intercourse but who have orgasms very readily during masturbation. Many prostitutes, for example, masturbate.

There may be two reasons for this, first, the stimulation of the genitalia is not sufficient to produce an orgasm or the woman has no love for the man with whom she is cohabitating. Then there are women who have erotic dreams with orgasm but who have no orgasm during coitus. In some women there is a periodicity of libido, for example, at the end of menstruation.

By sexual anesthesia Moll means the lack of sexual desire. Many women complain of this and more who have sexual anesthesia say nothing about it; but severe conflicts in married life may result from this. Just as in man, there is one center for erection and another for ejaculation. For erection, in part psychic stimuli (visualization of the man) and in part somatic stimuli (mild irritation of the

erogenous zones) suffice. But these stimuli are not sufficient to produce ejaculation and orgasm, for there must be stronger stimuli and a definite individual rhythm. In some cases sexual desire is suppressed because in early life the child was taught to consider everything sexual as unclean and sinful. In other cases sexual anesthesia is congenital.

An important factor in sexual anesthesia is the lack of choice of the proper partner. Some women have no orgasm during coitus with their husbands, but are gratified by other men whom they really like.

A study of prostitutes revealed the fact that nearly all of those who had protectors with whom they had sexual intercourse, had orgasms during coitus with the protectors but with none of the patrons. Hence, it may be concluded that the mind plays an important rôle in the sexual gratification of women.

Local diseases of the genitalia may suppress sex desire. In women the clitoris appears to be an organ of desire. On the other hand, if during coitus the clitoris is not stimulated there is no orgasm. Masturbation may produce sexual anesthesia through elevation of the threshold of stimulation.

Moll believes that two-thirds of all women have sexual anesthesia. Sex desire and ejaculation are not necessary for conception. Out of 221 women with sexual anesthesia only 40 were sterile. Treatment depends upon the cause and to determine this a complete confidential history must be obtained.

J. P. GREENHILL.

**Lipschutz:** On the "Genital Papillae" of Women. Wiener Klinische Wochenschrift, 1923, xxxvi, 692.

The function of the labia minora depends on the sebaceous glands which they carry. These glands are not found in the fetus but appear during childhood, reach their greatest development during the fertile age, and then atrophy. The labia also afford protection against trauma and infection.

The author describes papillae found on the inner surface of these organs similar to those found on the tongue. Histologically they show tissue rich in capillaries resembling erectile tissue with many endbulbs of Krause scattered through it, the whole covered with thick or thin epithelium. Because of this picture and because they are found well-developed from the fourteenth year of age to the menopause, he feels that their function is similar to that of the clitoris.

FRANK A. PEMBERTON.

**Binger:** The Psychical Etiology and Treatment of Leucorrhea. Therapie der Gegenwart, 1923, lxiv, 346.

The author believes that besides the well known local pathologic causes of leucorrhea and its occurrence with constitutional diseases such as chlorosis, diabetes, etc., there is a form caused by psychical disturbances. The secretion from the glands of the cervix as well as from Bartholin's and the endometrial glands varies in amount. These glands are under the control of the autonomic nervous system as are the sweat, internal secretory, gastric and intestinal glands. Therefore they may be influenced by the psyche. Other stigmata found in such patients are pruritus, vaginismus, pelvic pains, and psychologic disturbances of menstruation. A few cases have been reported that were relieved by neurologic measures, hypnotism and suggestion.

The author discusses at considerable length the various psychical traumas to which women are exposed, especially from the sexual side. Fifteen cases are given in abstract which show good results with treatment by suggestion and persuasion. No definite pathologic cause could be found for the leucorrhea in any of them.

F. A. PEMBERTON.

**Morawitz: A Few Relationships of the Blood to the Female Genitalia.** *Zeitschrift für Geburtshilfe und Gynäkologie*, 1924, lxxxvii, 278.

The author describes three cases of hemorrhagic diathesis, two of these belonged to the thrombopenic purpura (*Morbus Werlhof*), the other to the athrombopenic form. All three cases appeared in the premenstrual period, and the diathesis disappeared shortly after the beginning of menstruation. On the basis of these observations and a number of reports in literature, these hemorrhagic diatheses are regarded as of hormonal origin. It is probable that in the premenstrual period there is some influence of the corpus luteum upon vessel walls and blood forming organs (megakaryocytes) which may become manifest in a tendency to bleed. From the rather scarce reports in literature, the disease here reported differs from athrombopenic purpura in that, the bleeding occurred but once, so far as the cases have been observed.

MARGARET SCHULZE.

**Puppel, E.: Disturbances in Vision after Hemorrhages from the Genitalia.** *Monatsschrift für Geburtshilfe und Gynäkologie*, 1924, lxx, 351.

The relationship between the eyes and genital disease is fairly close as demonstrated by eclamptic amaurosis, albuminuric retinitis in pregnancy, puerperal septic panophthalmitis, etc. Puppel reports 2 cases of blindness which occurred after uterine hemorrhage. The first patient had a large myomatous uterus and her eyesight improved markedly after hysterectomy. In the second patient the eyesight also improved considerably after hysterectomy. These are the only two cases the author has seen in the course of 20 years. He never saw blindness after postpartum hemorrhage and never saw it on the battlefield after severe hemorrhage. In the literature there are reports of about 300 cases like the two the author reports.

Many hypotheses have been brought forward to explain the blindness associated with genital hemorrhage but in the last analysis it appears that the anemia is the actual cause. All authors are agreed that the prognosis is bad unless the bleeding is stopped and this, according to Puppel, is best accomplished by vaginal total extirpation unless large tumors are present, when one must resort to abdominal hysterectomy. Those who believe the etiology of the blindness to be due to auto-intoxication through products from the ovaries, remove the ovaries.

Radiation is not advisable, because if applied during the hemorrhage it may cause an increase rather than a decrease of bleeding. Furthermore, if large doses are applied there is a fall in the hemoglobin content of the blood and anemic patients when radiated show a still further fall in the number of red blood cells.

J. P. GREENHILL.

**Eufinger, H.: Death from Hemorrhage due to Excessive Menses in a Patient With Marked Diabetes Mellitus.** *Monatsschrift für Geburtshilfe und Gynäkologie*, 1922, lviii, 1.

True diabetes mellitus is a rare complication of pregnancy because diabetic women seldom are fertile. In general, diabetes has little influence on menstruation and above all there is no relationship between the intensity of the diabetes and the severity of the menstrual disturbances.

While there is usually an amenorrhea or an oligomenorrhea, there are occasional cases of marked increase in menstrual bleeding which lead to mistaken diagnoses. The author cites the case of a 17 year old girl who had a profuse hemorrhage and whose condition was diagnosed as an abortion. Her menses had begun at 14 and had occurred regularly every four weeks. On only one occasion had there been a profuse period lasting eight days. On admission to the hospital she was in coma, almost pulseless. The urine contained sugar, acetone and diacetic acid. The



uterus was packed and the bleeding controlled, but the patient died suddenly three days later. At autopsy the uterus showed only menstrual changes, the pancreas the changes of diabetes, and all the organs were anemic. The cause of death apparently was anemia.

The author suggests that perhaps the diabetes arose from a disturbance in the equilibrium of internal secretion in which the relation between the pancreas and the generative glands appeared to play the greatest rôle.

J. P. GREENHILL.

**Hartog: Gynecology and Rhino-Laryngo-Otology.** *Nederlandsch Tijdschrift voor Verloskunde en Gynaecologie*, 1924, xxix, 256.

Hartog believes that congenital deafmutism is more often due to actual injury of the hearing mechanism during labor than is usually supposed. The injury may consist merely in hemorrhage into the labyrinth or cochlea and may be caused by undue pressure over the temporal bone as in awkward application of the forceps. While the deleterious effect of pregnancy on otosclerosis is well known, the actual *modus operandi* is still in the dark.

The danger of allowing pregnancy to proceed in a woman suffering from laryngeal tuberculosis, Hartog feels, is not sufficiently appreciated by obstetricians. Even if such a patient should survive a pregnancy, he urges sterilization to avoid further conception.

While dysmenorrhea is at times relieved by nasal applications of various kinds, neither the review of the literature nor his own experience have convinced Hartog of the existence of definite "genital spots" in the nose. The congestion of the nasal mucosa sometimes encountered during menstruation is rather an expression of general circulatory changes incident to menstruation than of any relationship between the nose and the genitalia.

R. E. WOBUS.

**Brakemann: Changes of the Female Genitalia in Lymphatic Leukemia.** *Zeitschrift für Geburtshilfe und Gynäkologie*, 1923, lxxxvi, 23.

There is very little literature upon the subject of the leukemic changes in the female genitalia. The disease is only half as common in women as in men, yet is not so rare but that one should expect to find involvement of the genitalia in a considerable number of cases. It has been found, however, that even where profuse and uncontrollable hemorrhages from the vagina focused direct attention on the genital tract, the gross anatomical findings were often entirely negative, even where later histologic investigation showed extensive infiltrations in all the organs of the genital sphere.

The author describes a personal observation. In a 31-year-old nulliparous woman symptoms began in July, and included mouth, nasal and vaginal hemorrhages. She died in October. Typical leukemic changes were found in liver, spleen, lymphnodes, etc. The pelvic organs showed the following changes: The uterus was of normal size but of firm consistency; the cavity filled with blood; the tubes were thickened with open fimbriated extremities, and their lumina also contained blood clots. The right ovary was enlarged to the size of a watch, with dilated thrombosed vessels in the mesovarium and infundibulopelvic ligament. On section, the ovary showed extensive interstitial hemorrhages, with only a few corpora fibrosa and one old corpus luteum remaining as recognizable normal structures. The left ovary was moderately enlarged but aside from this showed no gross changes.

The right ovary showed microscopically an intense vascular congestion with marked hemorrhagic extravasation into the tissues and such a diffuse infiltration with lymphocytes that under high power the picture was that of a hyperplastic

lymphnode. These changes were most marked in the medulla, the tunica albuginea and outer portions of the cortex were free of all cellular infiltration and showed isolated unchanged primordial follicles. The mesovarium showed large thrombosed vessels containing islands of lymphatic elements. The left ovary showed similar changes except that the hemorrhagic extravasation was absent.

The tubes showed a lymphocytic infiltration, especially of the tunica propria of the mucosa and the connective tissue of the mesosalpinx. The tube lumen was filled with an organizing thrombus. Both cervix and corpus uteri showed lymphocytic infiltrations between the muscle bundles. Only a small amount of the basal layers of the endometrium was still present. Both the portio vaginalis and the vagina had large defects in the squamous epithelial covering and a dense lymphocytic infiltration of the subepithelial layers.

The author concludes with a brief review of the literature, including a number of cases where lymphatic leukemia developed during pregnancy, or where leukemic women became pregnant.

MARGARET SCHULZE.

**Ludwig and Lenz: The Action of Drugs on the Uterus as viewed Through an Abdominal Window.** *Zeitschrift für Geburtshilfe und Gynäkologie*, 1924, lxxxvii, 92.

This article describes the action of various drugs upon both pregnant and non-pregnant uteri of rabbits and cats, as observed through a celluloid window sewed into the abdominal wall in the manner described in a previous article.

The first drug employed was adrenalin in a dosage of 0.15-0.3 c.c. of a 1:1000 solution, intravenously in the rabbits and subcutaneously in the cats. The results were practically the same in the two animals, but markedly different in the pregnant and nonpregnant uteri. There was an immediate cessation of all uterine motions in nonpregnant animals. The uterus remained for a period of five to fifteen minutes in the same state of tonus it was when the injection was made whether this happened to be one of contraction or of relaxation. The uterus became extremely anemic, taking on a snow-white color which showed up in marked contrast to the intestinal coils, which developed a far less marked anemia. Following the acute adrenalin reaction which lasted about 15 minutes, the uterus developed patchy and then marked generalized hyperemia, peristaltic contractions reappeared and in 30 to 40 minutes the whole condition had returned to normal.

In the pregnant animal, the result was almost the exact opposite. There was an increase in peristalsis and the appearance of deep tonic ring-contractions. There appeared a moderate anemia, which was definitely less marked than in the non-pregnant uterus. After about 15 minutes, both contractility and circulatory conditions returned to normal.

Pituitrin was next used in doses of 0.5 intravenously in both cats and rabbits. The results showed that in both the gravid as well as the nongravid uterus, the main result of pituitrin was a tetanizing one. Pituitrin causes an immediate cessation of all peristaltic uterine activity. The whole organ shows a maximum tonic concentric contraction and falls into a complete lasting tetanus which leads to a very well-marked striking anemia. This phase lasts about ten minutes and then gradually goes over into a second one which is characterized by the alternation of a generalized state of relaxation and of tonic contraction and the formation of deep, more or less numerous tonic contraction rings, without any indication of peristalsis. The third phase is characterized by the occurrence of a cylindroid peristalsis, in which contractions of the longitudinal musculature travel as waves down the organ. The circular musculature, however, shows no definitely visible peristalsis. Relaxation and tetanic contractions alternate, and lead in places to the formation of well-marked contraction rings. After the first phase, the cir-

ulation of the uterus is improved, and during the stage of relaxation is very markedly hyperemic.

Placental extract shows practically the same characteristic action, both on the gravid as well as the nongravid rabbit and cat uterus. Doses of 0.2-2 c.c., given intravenously or subcutaneously, influenced particularly the normal forms of peristalsis so that these became much more intense, longer lasting and more frequent so that the whole organ seemed almost constantly in motion. There was a uniform rhythmic peristalsis of the circular as well as the longitudinal musculature, in which the deep ring contractions disappeared almost entirely. The blood vessels are slightly dilated and the circulation of the organ is increased.

Sekakornin and gynergen in doses of 0.5 to 2 c.c. given intravenously or intramuscularly produced practically the same action on gravid, puerperal and nongravid rabbit uteri. The action could be divided into four phases: first, a phase of maximum tonic concentric contraction which lasted about three minutes. This was followed by the appearance of stable non-moving sharply demarcated ring contractions, without any sign of relaxation or of peristalsis. This phase lasted about twenty minutes and was followed by another of deep annular peristaltic waves, with increased general tonus, lasting about one and a half hours and finally followed by a period of increased, very strong, normal, general peristalsis with permanently increased tonus.

Uteramin (p-oxyphenyläthylamin) in doses of 0.1 to 1.0 c.c. intravenously produces in the puerperal as well as in the normal rabbit uterus, a sudden marked tonic contraction without increased motility. The organ appears much stiffer but is well supplied with blood. This period lasts for about ten minutes, then there appear strikingly strengthened, prolonged and more frequent pro- and antiperistaltic waves of the normal type without very marked formation of contraction rings, and the general tone remains increased for an hour or more.

Atropin sulphate, 0.005 gm. intravenously, causes after a few minutes in the normal nonpregnant rabbit uterus a complete relaxation of the organ (a marked decrease in tonus) with a definite decrease in peristalsis. The action is very prolonged, lasting many hours.

These results, then, show that the various drugs produce markedly different specific actions on the motility of the uterine musculature, and may explain the marked difference in their clinical action in the human.

MARGARET SCHULZE.

**Ogilvy: The Afferent Nerve Supply of the Female Genito-Urinary Organs and the Bowel.** The Practitioner, 1920, cv, 421.

The author attempts to localize various types of pelvic pain according to afferent nerve distribution in view of their embryonal development: "It appears to me that the tenth thoracic nerve supplies the functioning portion of the kidney, the ovary and the small bowel—all of which are highly functioning; that the eleventh thoracic nerve supplies the upper branching extremity of the ureter, the uterine tube and the ascending and transverse colons; the twelfth thoracic nerve supplies the ureter, the uterus and the descending and sigmoid colons, all of which are comparatively passive carriers, except for the absorbing function of the large bowel; that the first lumbar nerve supplies the bladder, rectum and uterus, all of which are organs of convenience; and that the third and fourth sacral nerves supply the trigone and urethra, the os and vagina, and the anal canal, all of which are outlets."

The only difficulty in accepting such a definition is that no account is taken of "traction on the splanchnics" in displacements nor on the referred pains in different lesions of the generative and urinary systems which do not conform to the areas served by a single posterior root nerve.

A. N. CREADICK.

**Lubosch: The Development of the Ligamentum Uteri Teres and the Inguinal Region in the Human.** Zeitschrift für Geburtshilfe und Gynäkologie, 1924, lxxxvii, 467.

The author gives a brief review of the literature and a sketch of the embryology of this region with a number of illustrations.

MARGARET SCHULZE.

**Dretl: A Contribution to the Biology of the Cervix.** Zeitschrift für Geburtshilfe und Gynäkologie, 1924, lxxxvii, 447.

The author made his studies upon cervical secretion obtained under special precautions to avoid bacteriologic or chemical change. He found that he could prove the presence of amylase, which split off maltose from starch. The fermentative power was highest in the premenstrual period, much weaker in the postmenstrual, weakest in the intermenstrual. The diastase appeared to be formed in the cervix, since the fundus uteri after hysterectomy never showed the presence of the ferment. The cervical secretion shows an amphoteric reaction, in the premenstrual period, the acid content increases, the alkaline decreases, in the intermenstrual period the reverse holds true. The varying fermentative power probably depends upon an activation in the presence of acid, and a crippling by an excess of alkali.

MARGARET SCHULZE.

**Emge: Varicose Veins of the Female Pelvis.** Surgery, Gynecology and Obstetrics, 1921, xxxii, 133.

Emge thinks that varicose veins of the broad ligament, and especially in the ovarian circulation, are quite common and are the cause of considerable pain and discomfort. To aid in their diagnosis he makes a vagino-rectal examination alternating in the recumbent and sitting position.

Mild cases, in his opinion, can be permanently relieved by conservative measures, while high suspension of the uterus with shortening of the uterosacral ligaments offers the best means for permanent symptomatic cure. Resection of the veins and hysterectomy are superfluous.

R. E. WOBUS.

**Fothergill, W. E.: Varicocele in the Female.** British Medical Journal, 1921, No. 3179, p. 925.

Anatomists describe five plexuses of veins in the female pelvis: the vaginal, the uterine, the vesical, the hemorrhoidal, and the pampiniform plexus. Venectasies are often seen with chronic inflammatory conditions and neoplasms. The common symptom is a dull aching pain, low down in the left side, often in both sides. This is often preceded by a congestive dysmenorrhea. The pain is usually made worse by constipation. Diagnosis is made from the symptoms in the presence of some of the causative factors. It may be possible to feel the veins especially with the patient in standing or sitting posture. At present there is no local or surgical treatment available. Therapy consists mainly of palliative measures, careful personal hygiene, regular exercise, avoidance of constipation and avoidance of improper work.

F. L. ADAIR.

**Dales: Rectal Examination in Gynecology.** Le Progrès Medical, 1924, No. 6, p. 77.

In an article accompanied by six diagrammatic illustrations the author brings out the value of rectal examination in gynecologic cases. He finds this method of examination to be especially useful in the replacement of retroversion either

with or without adhesions, in the examination of pelvic tumors located low in the pelvis, and in following the progress of labor in obstetrical cases.

The reason for its advantage in the first two conditions is that the examining finger can pass higher into the pelvis thus more definitely outlining the organs present than by the vaginal route, where the examining finger is stopped by the vaginal wall of the posterior fornix. The advantage in obstetrical cases is that it permits the obstetrician to closely follow the progress of any case without submitting the patient to the dangers of infection.

THEODORE W. ADAMS.

**Pitcher, H. F.: Pruritus Ani et Vulvae.** American Journal of Electrotherapeutics and Radiology, 1922, xl, 51.

Twenty-three cases of pruritus ani et vulvae have been treated with ultraviolet light. The relief of itching was instantaneous and the recovery permanent, in some of the cases extending as long as two years. In the preparation of the patient, all hairs are closely cut. The affected parts are thoroughly cleansed with soap suds, carefully dried, and all crusts removed. Any redundant perianal folds which may serve as hiding and breeding places for bacteria, are smoothed out with gloved hands so that the light may sterilize all of the recesses. The healthy skin must be protected and a careful plan of application mapped out so as to avoid overtreatment of any one place. The light is applied by means of the Kromayer Quartz Lamp at a distance of 3 inches. Beginning with four minutes, each subsequent treatment lasts one or two minutes longer. Three treatments are given the first week, two the second week, and one every one to two weeks as occasion requires. The average number of treatments required to make the cure permanent, ranged between six and twelve.

GEORGE GELLHORN.

**De Aragon: Filarian Elephantiasis of the Vulva.** Revista Cubana de Obstetricia y Ginecologia, 1920, ii, 12.

This case is reported by the author under the title of "verrucous elephantiasis of the vulva." It is however of more interest to call attention to the filarian origin of the condition, for verrucous elephantiasis in the temperate climates is not due to this or apparently to any other parasite. The patient was a white girl of 18 years. She had a virginal leucorrhea which was readily distinguished from an infectious vulvo-vaginitis. There was a history of slow enlargement of the labia majora and the parts were covered with verrucae. The occurrence of painful crises with fever up to 104, chills and headache suggested filarial infection. These crises were in no way associated with the menstrual epochs. In the past few months the patient had been losing much weight and complained of insomnia. She had the melancholic facies. Examination of the external genitals showed no anomalies of development. The labia majora were two or three times the normal size but the deformity was far less marked than in the usual book illustrations. The warty masses were arranged in groups and the warts were of various sizes. They extended in front to the mons and laterally to the groin on the right side. At the posterior portion of the labia the warts were ulcerated with an offensive discharge. Although the presence of the febrile attacks made the diagnosis almost certain, hemoculture was practised and embryos of the *filaria Bancrofti* were found present. Treatment consisted in excision of the labia, followed by suture.

GRAFFIANO.



**Peterson: Obstetrics and Gynecology from the Standpoint of the General Practitioner.** Ohio State Medical Journal, 1921, xvii, 538.

A general article which covers the drifts in the practice of medicine, the requirements for specialization and general practice; groups and clinics; the rôle of the general practitioner; obstetrics and gynecology in relation to the general practitioner, and finally the futility of state medicine. The author concludes that "the general practitioners have been fooling themselves when they have the game in their own hands. This country is not looking for specialists, they are to be found on every corner. What the country wants is more family doctors."

W. K. FOSTER.

**Watson, B. P.: The Past, Present, and Future of Midwifery.** British Medical Journal, October 21, 1922, p. 712.

The author briefly sketches the history of the Chair of Midwifery in the University of Edinburgh. It was instituted February 9, 1726. No other medical school had at that time established such a professorship, Strasburg following only in 1728. He calls attention to the necessity for reducing both maternal and fetal deaths, especially those due to infection. He points to the necessity for antenatal care of the prospective mother, and emphasizes the importance of postnatal clinics. Finally he dwells on the urgent need for improvement and enlargement of the Royal Maternity Hospital of Edinburgh.

F. L. ADAIR.

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## Item

### AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS AND ABDOMINAL SURGEONS

The following Officers of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons were elected for the year 1924 and 1925.

President: Dr. Asa B. Davis, New York City, N. Y.

First Vice President: Dr. William E. Darnall, Atlantic City, N. J.

Second Vice President: Dr. Henry Schmitz, Chicago, Ill.

Secretary: Dr. James E. Davis, Detroit, Mich.

Assistant Secretary: Dr. G. V. Brown, Detroit, Mich.

Treasurer: Dr. Wm. G. Dice, Toledo, Ohio.

New Members of the Executive Council: Dr. James F. Baldwin, Columbus, Ohio, and Dr. E. A. Weiss, Pittsburg, Pa.

## Books Received

**HANDBUCH DER GEBURTSHILFE.** In drei Bänden und Ergänzungsband. Herausgegeben von A. Doederlein, München. Erster Band mit 279 Abbildungen im Texte und 4 Tafeln. Zweite Auflage. Verlag von J. F. Bergmann, München, 1924.

**THE INTERNAL SECRETIONS.** For the use of students and physicians. By Dr. Arthur Weil, Assistant Professor of Physiology, University of Halle. Authorized translation of third German edition by Jacob Gutman, M.D., etc. Director Brooklyn Diagnostic Institute. The Macmillan Co., New York, 1924.

**BIOLOGIE UND PATHOLOGIE DES WEIBES.** Handbuch der Frauenheilkunde und Geburtshilfe. Herausgegeben von Josef Halban, Wien, und Ludwig Seitz, Frankfurt a.M. Lieferung 10. Urban und Schwarzenberg, Berlin und Wien, 1924.

**GREFFE ANIMALE,** ses applications utilitaires au Cheptel. Par le Dr. Serge Voronoff. Directeur du laboratoire de chirurgie expérimentale du collège de France, etc., Avec 59 planches dans le texte. Librairie Octave Doin. Paris, 1925.

**INTERNATIONAL CLINICS.** Volume III. Thirty-fourth Series, 1924. J. B. Lippincott Company, Philadelphia, 1924.

**LEHRBUCH DER OPERATIVEN GEBURTSHILFE.** Von Professor Dr. Sigfrid Hammerschlag, Direktor der Brandenburgischen Hebammenlehranstalt und Frauenklinik in Berlin-Neuköln. Zweite neubearbeitete Auflage. Mit 200 Abbildungen. Verlag von S. Hirzel, Leipzig, 1924.

**DIE MIKROSKOPISCHE AUSRÜSTUNG DES ARZTES.** Von F. W. Oelze, Privatdozent fuer Dermatologie an der Universität Leipzig. Mit 126 Abbildungen im Texte. Verlag von Leopold Voss, Leipzig, 1924.

**DIE KLINIK DER BOESARTIGEN GESCHWÜLSTE.** In drei Bänden. Herausgegeben von Geh. Rat Professor Dr. P. Zweifel and Geh. Med. Rat Professor Dr. E. Payr. Erster Band. Mit 204 Textabbildungen und 33 farbigen Tafeln. Verlag von S. Hirzel, Leipzig, 1924.

**ULCUS VULVAE ACUTUM.** Von Dr. B. Lipschuetz, Privatdozent an der Universität Wien. Mit 23 Abbildungen im Text. Verlag von Leopold Voss, Leipzig, 1924.

**HANDBUCH DER KINDERHEILKUNDE.** Herausgegeben von Professor Dr. M. von Pfaundler in München, und Professor Dr. A. Schlossmann in Duesseldorf. Vierter Band, dritte Auflage. Mit 8 Tafeln und 163 Textfiguren. Verlag von F. C. W. Vogel, Leipzig, 1924.